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STEEL

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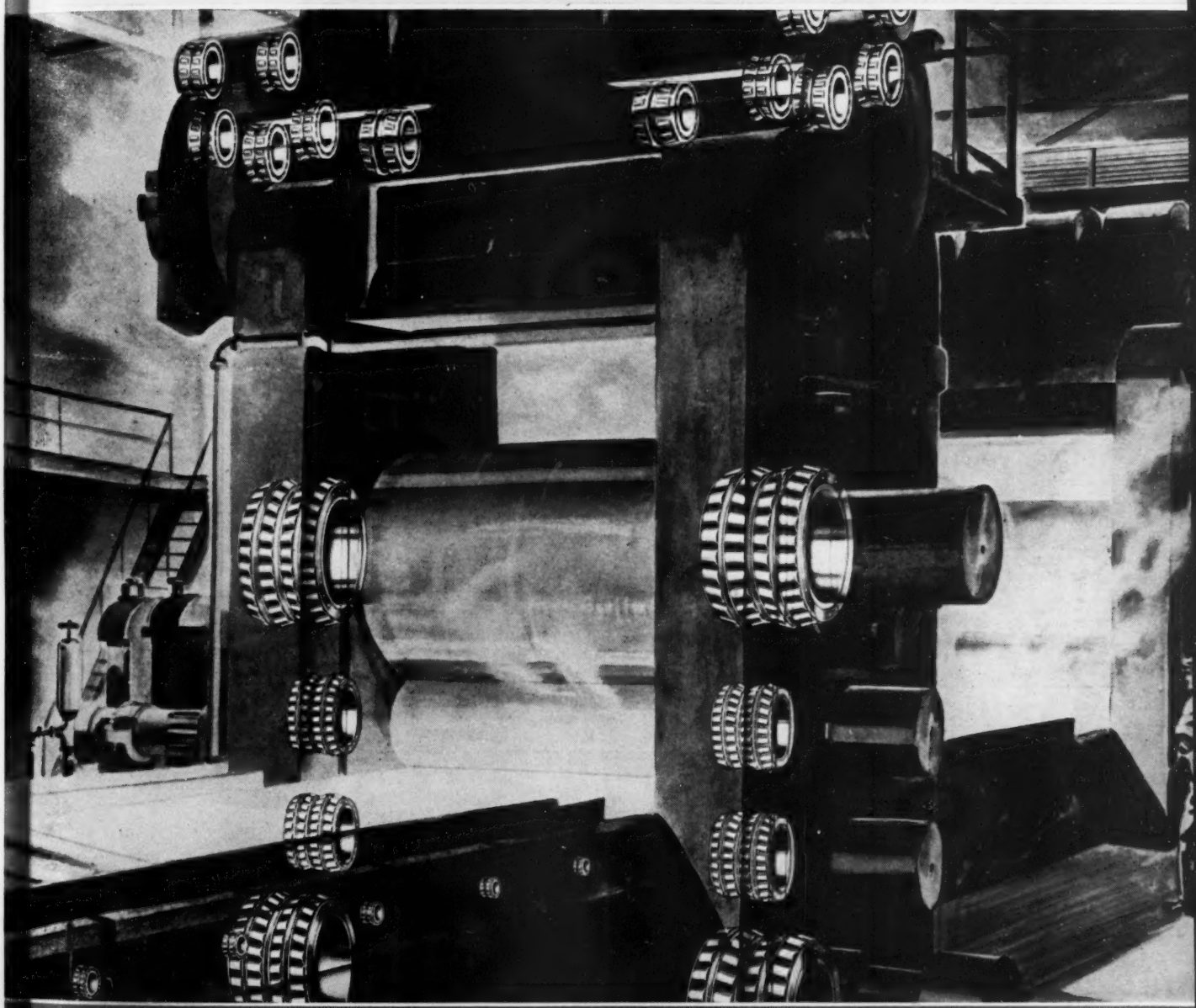
The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

EDITORIAL INDEX, PAGE 47



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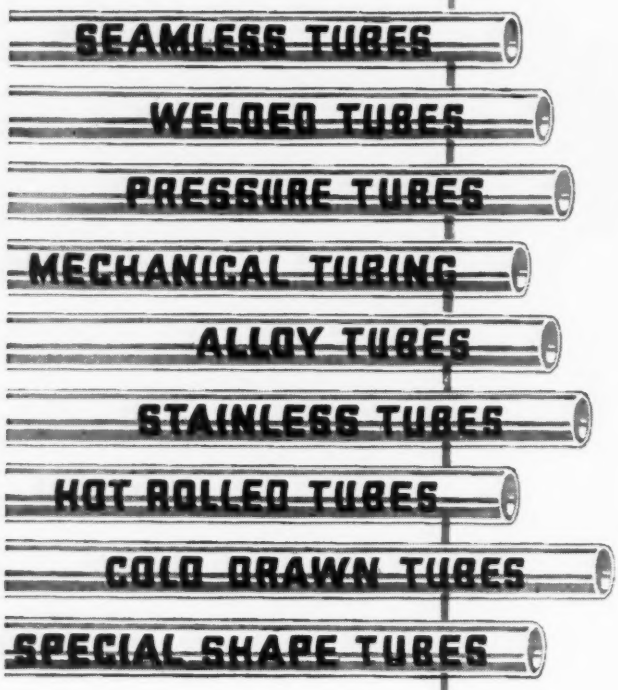

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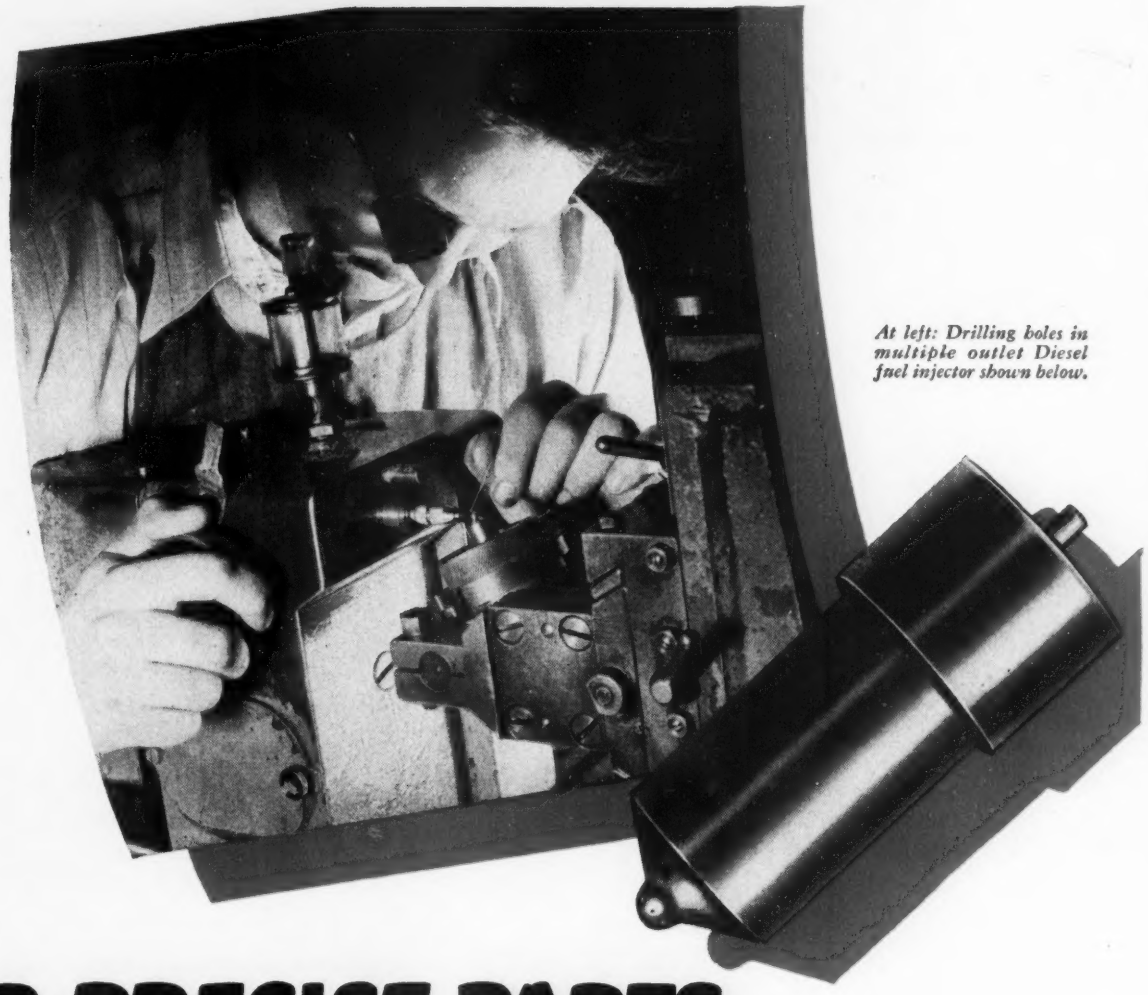

At left: Drilling holes in multiple outlet Diesel fuel injector shown below.

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Behind the Scenes...

Free From Fire & Theft

We learned the other day that there's a brand new Hudson in New York sitting quietly by itself. Might even be unlocked, for all we know. Nobody is going to try to spirit it away, however, because it is in the lobby of the Capitol theater and it requires the assistance of the fire department, the police department, and various and sundry other groups to get it out. Seems that some bright publicity lad conceived the idea of slapping it in there as a promotion stunt, which was good (the idea, that is), but which required the tearing down and rebuilding of the front of the theater, special surveillance of the project by fire wardens, surveys of the building and the floor loads by architects, union consultations to determine who had jurisdiction over the removal of hinges on the doors which had to be removed. All this had to be done at night, incidentally.

Monday Morning Mail

A. W. Gregg of the Whiting Corp. was sitting at his desk in Harvey, Ill., Monday morning, July 19. As is his usual custom, he was reading STEEL. He was particularly interested in our July 19 issue, because on page 116 we had published an article about charging open hearths with cupola metal, same article having been authored by Mr. Gregg. Consequently, he reached for the copy as soon as the mail came in that morning. While he was looking for the article, his phone rang. It was a long distance call from a man up in Michigan whose mail apparently had been delivered a little bit earlier. At any rate, he had already read the article and lost no time in phoning Mr. Gregg to find out how to put the process into immediate use. At this point, Mr. G. is quite in agreement with us that you folks who read STEEL are men of action.

Stripping in Berea

A couple of weeks ago, as a service to those of you who are interested in steel, prices and procurement of, our editors ran a 2-page table showing where the mills are located that steel prices are f.o.b. of. Good job it was, too, but it brings forth a letter from Walter Carroll of Berea, Ohio. Now Berea, Ohio, is a small town near Cleveland, whose most famous product currently is Harrison Dillard, world's greatest hurdler, who unfortunately won't be hurdling for the American Olympic team. Underneath the shadow of Mr. Dillard and the college he represents, Baldwin-Wallace, lies the town of Berea. Mr. Carroll noted that we showed Berea as a basing point for cold rolled strip, and Mr. Carroll further asks why, because the town doesn't even have a strip tease, much less a strip mill. Our editors, however, are infallible (it says right here in fine print) and so when we confronted them with this statement from an old settler, they merely pulled out some correspondence with the top brass of the Cleveland Cold Rolling Mill Co., which is indeed located in Berea, and which also has a confirmed annual capacity of 240 tons of cold rolled strip! We suggest to all you hungry purchasing agents that you not ask for a place on their schedule, however. The editors tell us the plant is booked solid. Instead, if you don't have a copy of that 2-page table, drop us a line. We'll be happy to send you an extra copy, and you can then find out where all the mills are located, including Berea, Ohio.

Puzzle Corner

As any metalworker can plainly see, I had to spend $1.40 to get the chain fixed up two weeks ago. Here's a good one for research experts. Find the value of P in this algebraic equation:

$$\left(\frac{\frac{D-A+J}{\sqrt{F}}+H}{K}\right)\left(\frac{L(M+N)}{C^2}\right)\left(\frac{B}{E+G}\right)=P$$

where A is the number of counties in Indiana, B the age of A. Lincoln at death, C the feet in forty fathoms, D the height of the Cleveland Terminal Tower, E the weight of British stone, F the Centigrade boiling point, G the gallons in a tierce, H the weight of a bushel of oats, J the atomic weight of tungsten, K the number of cricket chirps per minute at 65 degrees Fahr., L the minutes in a New Zealand degree, M the number of letters in the Greek alphabet, and N the number of pints in a peck. We haven't tried to prove it, but we would almost be willing to bet you can find all that data in the World Almanac. It's the tierce, the tower and the chirps which intrigue us.

Shrdlu

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STEEL

Vol. 123—No. 5 August 2, 1948

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Low Temperature Process Dissipates Welding Stresses

Organic Finishes for Metal Products

Report of British Iron and Steel Institute Meeting

STEEL

The Magazine of Metalworking and Metalproducing

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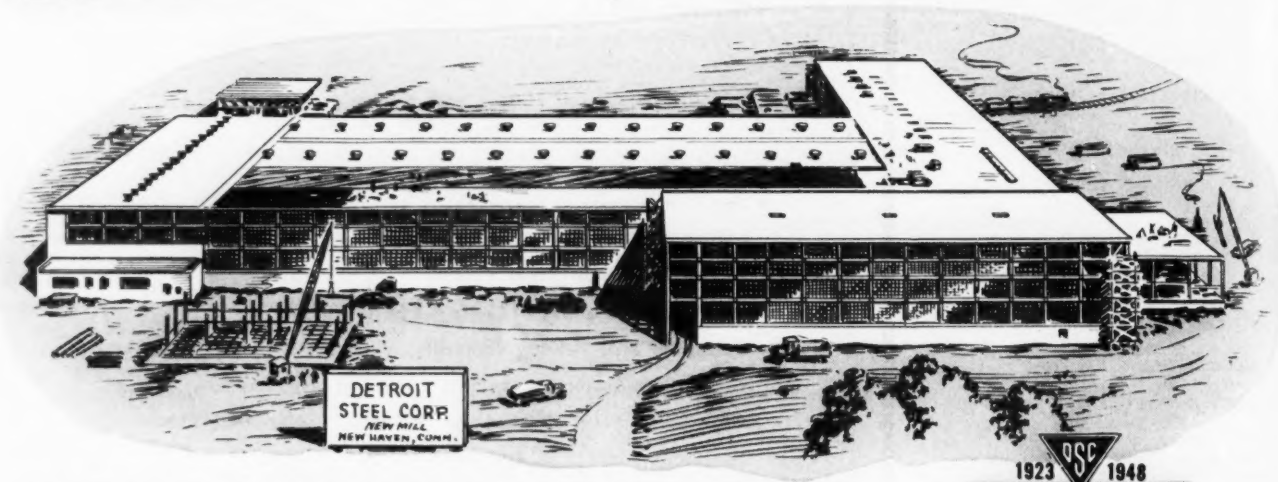

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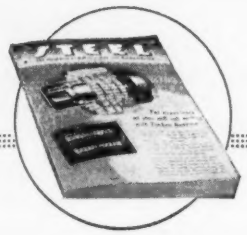

August 2, 1948

Profits and Inflation

It is unfortunate that the nation cannot combat inflation effectively. In his message to Congresss, President Truman did not exaggerate the grave danger of inflationary trends. He did exaggerate the remedial potential of his recommendations for checking inflation and he continued to ignore major factors that must be considered if inflation is to be curbed.

One trouble with his program is that it is designed more to advance "new deal" objectives than to attack inflation realistically. His plan is blind to the inflationary effect of reckless government spending and subsidized farm prices, but is wide awake to opportunities to utilize anti-inflation measures for expanding the power of the executive branch of the government at the expense of the legislative branch and to the detriment of American business. In these respects, the Truman proposals hew to the early "new deal" line of exploiting emergencies in the interests of politically profitable "reforms."

Proof of this is found in the President's references to business profits. No. 1 recommendation in his message is that an excess profits tax be re-established. His eighth proposal is "that price control be authorized for scarce commodities which basically affect essential industrial production or the cost of living. I have said before and I repeat that many profit margins have been adequate to absorb wage increases without the price advances that have followed."

These derogatory references to profits reek of the fake report the now Truman-discredited Henry Wallace cooked up when he was Secretary of Commerce. They completely ignore the fact that dividend dollars to stockholders are inflated dollars. Stockholders' savings provide $8000 of tools for every employee's job. Shall the owners of industry's tools be unduly penalized by discrimination?

High current profits help to make up for the deficit of risk money for investment in industrial corporations. Has the President forgotten that he himself said American industry will need $50 billion over the next few years for new tools and plant? Inflated profit dollars help provide these $50 billion. Excess profits taxes and anti-profit legislation would make it impossible to raise the $50 billion, either through profits or investment capital.

Attacking the 5.8 cents profit per income dollar will provide no effective brake on inflation.

* * *

MENACE OF MERGERS: Federal Trade Commission is worried about mergers. It reports that since 1940 mergers have resulted in the disappearance of more than 2450 formerly independent manufacturing and mining companies. It fears that elimination of basing points in the cement and steel industries will stimulate merger activity anew.

In calling attention to the higher frequency of consolidations and acquisitions in the years from 1940 to 1947, the commission is merely stating a fact of which industry is well aware. Mergers have been abnormally numerous during this period. However, unusual spurts in the merging of companies have occurred before. Consolidations were numerous at the turn of the century, during a few years following World War I and in the late twenties.

In these earlier periods of high merger activity, industry was somewhat reassured by the fact that each spurt of consolidations seemed to encourage new companies to enter the field. A classic example was the birth and vigorous growth of a number of independent steel com-

(OVER)

panies immediately following the formation of United States Steel Corp. in 1901.

Whether or not the abundant crop of mergers from 1940 to 1947 is a menace depends to some extent upon the number of new enterprises which are started. If economic or other conditions are tending to restrict the birth of new businesses, then grave danger is ahead. This is because an American industry consisting chiefly of corporation grants must be subject to regulation by the federal government.

The nation must preserve opportunity for men to launch small businesses and to develop them into successful enterprises. If this opportunity dies, big business will die with it and government will run all business. —p. 59

* * *

SIMPLE AND COMPACT: A new departmental setup has been established at the Elyria, O., plant of Bendix Westinghouse Automotive Air Brake Co. to process air compressor connecting rods and caps. In a 28 x 60-foot machining area, the new manufacturing layout has a monthly capacity of 30,000 parts based upon a 5-day week with two 8-hour shifts per day. The final product is considerably improved, close tolerances met, fewer rejects encountered, machining time and cost reduced 20 per cent.

This substantial saving has been accomplished chiefly by careful selection, arrangement and utilization of equipment. Connecting rod forgings are finished in 18 operations, 13 of which involve machining. Work flows from one machine, bench or inspection station to another with no backtracking. Steel chutes facilitate the movement of parts from one station to the next.

The entire layout is a model of simplicity and compactness. This, one suspects, is the key to the 20 per cent saving. —p. 84

* * *

WHERE BUILD PLANTS?: National Security Resources Board has issued a booklet entitled "Strategic Considerations in Industrial Locations." It indicates that the greatest degree of security against bombing attacks in time of war will result from dispersion of industrial plants. It dismisses as impractical for large scale application use of underground sites.

The booklet's argument for dispersion is based upon the reasoning that no country in the foreseeable future will have enough atom bombs to bomb any but the most important industrial centers—those greater than five miles square. Therefore it is desirable strategically to plan industrial expansion to avoid further urban concentrations of more than 50,000 people.

Fortunately, there has been a marked trend toward plant dispersion, initiated by industry because of factors other than security against bombing. Unfortunately, mill pricing, resulting from government pressure, now threatens to reverse this trend. Perhaps security from bombing is a factor which the Capehart investigators should consider in their study of the effect of antitrust laws. —p. 64

* * *

ADJUSTS MILL PRICES: Action of Bethlehem Steel Co. last Thursday in reducing prices from $1 to $3 per ton on 27 steel products should not have occasioned surprise in the trade. As pointed out repeatedly in these columns, the first mill prices posted by the various steel companies were necessarily tentative. It was inevitable that adjustments would be made.

Bethlehem announced its reductions were instituted "to meet competition found to exist in certain of our products." It is not likely that the wide variations in present quotations will continue long. Even under current conditions, wherein price competition is at a minimum, there will be a constant drift toward equalization of prices. Again buyers are advised to give the new pricing system time to jell. —pp. 58, 131

* * *

THIS BITE WILL HURT: At the present time voluntary agreements under Public Law 395 call for monthly allocations of 250,000 tons of steel for freight cars, 20,000 tons for atomic energy construction, 29,000 for warm air heating furnaces and 8430 for prefabricated housing. These total 307,430 tons a month or 3,689,160 tons annually.

Additional allocations tentatively agreed upon to become effective after hearings in August will call for monthly shipments of 105,273 tons to armed services, 16,529 for oil field tank and production equipment, 20,000 tons for inland waterway barges and 2500 tons for anthracite mine equipment. These total 144,302 tons monthly or 1,731,624 tons annually. Still pending are needs for shipbuilding, Marshall plan and several other projects.

The bite of this allocated steel out of the nation's output will be felt keenly by consumers in the open market. —p. 60

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

INFLATION—Recent wage and price increases have piled inflation on inflation and few people hold any hope that the administration or Congress can or will cope with the problem effectively (p. 55). Republican leaders in Congress see the President's program as a political maneuver and are unlikely to go along with it. Outside Washington, many observers view the talk about controlling inflation as locking the barn after the horse has been stolen. Wage increases, which started the spiral in 1945 and 1946, still lead prices in the skyward race.

PROFITS—Steel company earnings in the first half of 1948 show only slight changes from the comparable 1947 period, although total sales and total costs are up rather sharply (p.56). Producers are loath to predict the effect of the changeover to mill pricing and of recent increases in wages and prices on earning prospects for the second half.

MILL PRICING— Little enthusiasm for the change from basing point to mill pricing is found either among steel producers or steel consumers as the smaller steel companies follow the lead of the larger units in effecting the switch (p. 58). Industrialists believe the change will promote local monopolies, restrict competition, force some factories to close, curtail development of low-cost production and distribution and generally create confusion and uncertainties in the buying of steel and in the marketing of products made of metal.

ALLOCATIONS— Commerce Department officials believe they have gone as far as they can with voluntary steel allocations under the present law. Agreements already approved or in the final stages of approval provide for the channeling of almost 5½ million tons of steel annually (p.60). Programs in the discussion stage call for 1.8 million tons more. With so large a tonnage involved in the voluntary program, the Office of Industry Cooperation now is faced with the question of determining essentiality of the various programs.

KETTERING ENGINE—Oldsmobile is getting ready to start production on a high-compression V-8 engine for 1949 models. While this power plant may be known as the Kettering engine (p. 69), it will not be the ultimate unit envisioned by the GM boss researcher. The new engine will have a compression ratio of about 8.5 to 1, against the 12.5 to 1 mentioned by Kettering, and probably will not require high-octane gasoline, which the oil companies are not yet ready to provide in adequate quantities.

NEW YORK ORE— Jones & Laughlin Steel Corp. will draw one-eighth of its iron ore requirements this year from its Benson Mines in New York state (pp. 66-67) and plans to increase output from these mines in future years. Iron is locked in hard rock which must be blasted, magnetically separated and sintered.

SCRAP— Iron and steel scrap, perhaps the most serious supply problem of the steel industry since the war, has moved into higher ground pricewise. Producers hope to maintain a semblance of orderly procurement by adhering to the geographic and quality differentials informally set up in the "formula" adopted last autumn (p. 57).

HERE AND THERE IN INDUSTRY— Machine tool sales during the first half of 1948 were 9 per cent higher (p. 61) than in the comparable 1947 period . . . Geneva Steel Co. has finished about a third of its plate mill conversion (p.72) and completion is expected early in 1949 . . . Department of Commerce is deferring its comprehensive study of the steel industry (p. 64) as result of the changes in the pricing system necessitated by the Supreme Court decision and Federal Trade Commission actions . . . Stainless steel production (p. 61) has almost tripled in the past nine years . . . Dispersal of new industrial plants as a precaution against atomic bombing (p.64) is suggested by the National Security Resources Board . . . German steel prices (p. 65) are scheduled for an early increase to cover higher costs . . .Chrysler is spending $75 million (p. 70) for tools, dies and machinery for its 1949 program.

Engineering News, P. 83 *Market Summary, P. 131*

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STEEL
A PENTON PUBLICATION

Little Chance for Price Control

Special session of Congress gives President Truman's 8-point anti-inflation program chilly reception. Viewed as rehash of measures previously considered. Politics scented in maneuver

PRESIDENT Truman's 8 point anti-inflation program, presented the special session of Congress along with demands for other legislation of a highly controversial nature, appeared to be going nowhere late last week.

Cold reception was given the President's suggestions by the legislators, especially the Republican majority which scented "politics" in the President's maneuver.

At the week end it appeared certain little, if anything, would be done in the special session in the way of legislation aimed at placing the economy in the strait-jacket of government control. Indications were the session would be shortlived with bitter debate over civil rights legislation threatening to kill off any outside chance that major legislation of an economic nature would be enacted.

Message Is Rehash—President Truman's anti-inflation program, which was described by some congressmen as a rehash of previous messages to Congress, called for:

1—An excess profits tax to provide a treasury surplus and a brake on inflation.

2—Restoration of consumer credit controls.

3—Grant giving the Federal Reserve Board greater authority to regulate inflationary bank credit.

4—Regulation of speculation on the commodity exchanges.

5—Allocation and inventory control of scarce commodities which effect essential industrial production or the cost of living.

6—Strengthening of rent controls.

7—Standby authority to ration those products in short supply.

8—Price control of scarce commodities and authority to limit wage adjustments which would force a break in price ceilings.

Turned Down Previously—Most of the President's anti-inflation suggestions were given the brush-off at the regular session of Congress, such as allocation and inventory controls, standby rationing powers, price and wage controls, etc.

Provides Price Rollback — The administration's anti-inflation bill, introduced by Representative Spence (Dem., Ky.) provides for a rollback in prices to November, 1947, levels. Maximum prices would be established on commodities important in the cost of living or in industrial production whenever the price had risen or threatens to rise at least 20 per cent over June, 1946, levels.

Several loopholes are provided in the rollback provision. The industry affected must be consulted before the price order is issued; maximum price orders would be reviewed either at the request of the industry or on government initiative; adjustment of individual hardship cases is provided and regulations must be "practicable and enforceable." Steel and nonferrous metals are candiates for control.

The view of the Republican majority in Congress is that the President already has the power to control inflation. As for restoration of price control and rationing, in the view of Republican spokesmen, these just won't work except under police-state condition. Price control, it is held, would only choke production, encourage black markets, and result in confusion in the economy.

Meanwhile, as the forensics in Washington reach fever heat, the postwar boom continues to boom.

Steel Wage, Price Rise General

GENERAL pattern of wage and price advances effected at mid-July by United States Steel Corp. subsidiaries has been followed in the main throughout the industry.

TRUMAN AGAIN ASKS CONGRESS FOR ANTI-INFLATION CONTROLS

Over the past week or 10 days virtually all leading independent steelmakers have announced policy, effecting wage increases ranging from 9½ cents to 25 cents per hour over the range of job classifications, and price increases averaging over $9 per ton.

Prices Not Uniform—With respect to prices, while the advance has been general throughout the industry, there is a noticeable lack of uniformity in quotations.

Very few metalworking companies in the Pittsburgh area, under contract with USA-CIO, have to date agreed to granting their employes a wage increase.

The wage increases granted so far by fabricators here have not followed the pattern established among basic steel producers, with advances from

8 to 13 cents an hour reported. Some of the companies have signed up for one year, while others are on a two-year basis, same as among steel producers.

Manufacturers Assess Costs

FULL impact of the steel price advance on consumer and durable goods remains to be assessed, buyers now wrestling with varying prices on certain steel products quoted by the separate steel producers.

Further, manufacturers are handicapped in ascertaining cost positions by complexities attending abandonment of basing point pricing and consequent passing on of considerable freight formerly absorbed by the mills.

Extent to which higher raw material and wage costs will be passed along to ultimate buyers depends on a number of factors. Product lines in tight supply are expected to be upped fairly promptly. In fact, a few such advances already have been effected. On the other hand, products encountering buyer resistance are likely to move upward slowly, if at all.

Mill vs. Conversion Prices

INCREASE on the cost of autobody hot-rolled sheets by from 15-20 per cent, according to which mill supplies them, is a rough one to digest, although when consideration is given to what some fabricators are paying for the same or even inferior material produced through the conversion channel, the boost in mill prices from around $60 to $69 per ton is trifling.

Here is the approximate score on a conversion arrangement, the figures being vouched for by those close to the picture in Detroit:

Low-phos electric furnace scrap, gross ton, delivered in the Valley	$ 45
Charge for conversion to ingot, gross ton	12
Freight for shipping ingot to sheet bar mill	7
Cost of ingot, gross ton	$ 64
Charge for conversion to sheet bar, gross ton	35
	$ 99
Loss of 17 per cent in conversion makes sheet bar worth, gross ton	$119
Freight for shipping sheet bar to sheet rolling mill	7
Charge for conversion to 20-gage hot-rolled sheet	40
	$166
Additional 15 per cent scrap loss encountered in rolling sheet adds	29
Cost of 20-gage sheet, net ton	$195
Add value of 30 per cent scrap retained by conversion mills, @ $45 per ton, no credit allowed	13
Add freight on sheets delivered to fabricator	7
Actual cost of sheets at fabricator's plant	$215

Little Change in Profits

Sales and cost show uptrend. Effect of higher prices, wages on future earnings uncertain

STEEL company earnings for the first half of 1948 show little change from the comparable 1947 period. Some companies report slightly lower profits this year than last, while about an equal number of producers report higher earnings.

Total sales and costs show a definite uptrend, which will be further accented in the second half as result of increased steel prices, and of higher steel wages, freight and other costs.

United States Steel Corp. earnings for the first half this year were $66,543,018, or about $2 million less than in the first six months of 1947.

Sales by U. S. Steel amounted to $1,134,437,356 in first half 1948, against $1,008,804,481 in the comparable 1947 period.

Changeover to mill pricing may increase steel revenues for the present, according to U. S. Steel Chairman Irving S. Olds, but will not be beneficial in the long run. Many customers are adversely affected, he said.

Effect of higher steel prices and higher steel wages, and other costs, on second half earnings cannot yet be predicted, the U. S. Steel chairman said.

First half and second quarter earnings for 1948 and 1947 for steel companies reporting last week are shown in accompanying table.

	Second Quarter 1948	Second Quarter 1947	First Half 1948	First Half 1947
U. S. Steel	$32,585,677	$29,336,868	$66,543,018	$68,571,379
Bethlehem	15,099,775	12,408,966	30,499,392	28,499,392
Republic	7,805,410	5,214,820	16,938,390	16,731,615
Jones & Laughlin	6,341,197	5,366,124	11,491,901	11,703,256
Youngstown Sheet & Tube	5,609,764	4,293,389	12,033,330	11,629,138
National	7,364,275	5,775,757	16,026,035	13,100,815
Inland	6,549,849	4,975,431	15,008,393	10,171,288
Armco	6,157,055	6,312,104	12,024,402	12,230,980
Wheeling	3,043,475	2,841,804	5,824,732	5,790,072
Crucible	633,757	376,214	1,201,543	1,268,024
Portsmouth	904,915	1,024,359	1,933,460	2,033,679
Granite City	822,220	316,591	1,634,317	714,886
Allegheny Ludlum	1,624,344	1,688,031	2,931,815	3,517,640
Continental	406,254	248,231	619,671	641,454
A. M. Byers	555,700	438,480	1,080,900	849,414

Outlay Rise Greater in Steel

EXPENDITURES for modernization and expansion of the iron and steel industry are increasing more rapidly than those of all other manufacturing and mining industries combined.

This fact is established by the American Iron & Steel Institute from a comparison of the steel industry's proposed outlays in 1948 and its expenditures in 1946 and 1947 with similar Commerce Department data.

Although expenditures for new facilities by iron and steel producers and by other manufacturing and mining companies generally are parallel, iron and steel outlays in 1947 registered a greater gain over 1948.

Manufacturing and mining industries as a whole plan to spend $8450 million on new plants and equipment this year, or 3.7 per cent more than last year. Iron and steel companies' expenditures, however, will be nearly 14 per cent greater than last year. The total of $565 million for 1948 for iron and steel, will establish a record.

To Build Ferroalloys Plant

PITTSBURGH Metallurgical Co. Inc., Niagara Falls, N. Y., will begin construction soon on a $1 million ferroalloys plant on the Tennessee river near Calvert City, Ky. Facility will use the electric furnace process to produce such alloys as ferrosilicon, high silicon pig iron, high carbon ferrochrome, ferromanganese and low carbon ferrochrome silicon.

Detrola To Up Newport Capacity

INTERNATIONAL Detrola Corp., operating the former Andrews Steel Co. plant in Newport, Ky., has entered into contracts for two 80-ton electric furnaces, designed to lift potential from 42,000 to 58,000 tons of steel a month.

Scrap Formula Price Ceiling Lifted

Open-hearth grades continue to command more than pig iron. Composite price now is 126 per cent above wartime ceilings. Pressure still is upward

MOST turbulent factor in the postwar metals market has been iron and steel scrap. When price controls were removed late in 1946, scrap prices surged upwards and soon passed quotations for pig iron. During most of 1947 and the first half of 1948 open hearth scrap has commanded several dollars a ton more than steelmaking pig iron (see chart).

Contrary to prewar experience, the high prices for scrap did not increase the supply. The reservoir of scrap had been drained by prewar exports and by shipment of about 125 million tons of steel abroad during the war as munitions, lend-lease material, equipment for our armed services, etc. Scrapping of obsolete equipment was slowed by replacement difficulties. Demand for scrap was higher as result of war-born increases in foundry and steelmaking capacity.

Postwar Market Buoyant—The excess of demand over supply brought disorder to the scrap market. Steel mills were bidding against each other for available supplies and at times were invading the territories of other mills. Cross hauling was common. Purchases for ingot conversion deals complicated the picture. Scrap prices not only were far above those for pig iron but were approaching those for raw steel.

In a move to restore order and stability to the scrap market, steel mill buyers last fall established a "formula" which provided a voluntary ceiling on scrap prices at roughly twice the OPA ceiling, and reaffirmed geographic and quality differentials established in the prewar market and sanctioned by OPA during the war.

Thus, open hearth scrap at Pittsburgh was maintained at $40.50, at Detroit $37.50, at Chicago $39.50 and at Sparrows Pt. $39.00.

Prices Stabilized—Steel mill buyers threatened to take off open hearths before breaking the formula prices and in several test periods last winter a few furnaces were idled for lack of scrap. Generally, the formula prices withstood the severe tests, although occasionally a hard-pressed mill stepped out to buy a few car loads at above formula prices and conversion operators generally were willing to pay premium prices.

Prices were stabilized (STEEL'S scrap price composite fluctuated only slightly from last November until July), inter-district buying rivalry was reduced. As the formula became established, turnings, railroad and other grades of scrap took their place within it.

Lid Lifted — The steel price increases late in July brought new pressure for upward revision in scrap formula prices and steel mills last week generally admitted an upward revision of $2.50 a ton on steelmaking grades, bringing heavy melting scrap to $43 at Pittsburgh and $42 at Chicago. The composite price at $43.33 is 126 per cent above the wartime level of $19.17.

Steel mill buyers have no hopes that the higher price will bring out any substantial tonnages of material and are only wondering whether or not the price can be held at this level as winter approaches.

New Scrap Drive Planned

MEANS for increasing scrap supply came in for particular consideration at the mid-year meeting of the Institute of Scrap Iron and Steel Inc., Ambassador Hotel, Atlantic City, N. J., last week on July 26-27.

Requirements this year are scheduled to reach an all-time high, with needs of purchased scrap estimated at around 29 million tons. Last year purchased scrap had reached a new peak of 26 million tons, against the previous record of 24 million tons of purchased scrap in 1942.

To meet this current increase in demand a nation-wide drive for scrap is scheduled to begin early this fall, to carry on over the remainder of this year and, in fact, into the first quarter of next year. The drive will be sponsored by the United States Department of Commerce.

Overseas Scrap Emphasized—Alex Miller, Columbia Iron & Metal Co., Cleveland, and scrap advisor to the Office of Industry Cooperation, Department of Commerce, pointed out that it will be a three-pronged drive for industrial, auto-wrecking yard and overseas scrap, with particular emphasis on the latter.

Encouraging with respect to foreign scrap was the announcement at the meeting that General Clay had released 440,000 tons of indigenous scrap (as distinguished from army scrap) for shipment to this country from Germany, with the first cargo now being loaded.

H. T. Luria, Luria Steel & Trading Corp., New York, chairman of the Export-Import Committee, urged that the government liberalize the amount of dollars that German business men can make by exporting scrap and also urged direct dealings with these men by American dealers

instead of working through a special military committee.

Cost of preparing scrap has more than doubled since 1930, according to Richard V. Bonomo, Schiavone-Bonomo Corp. Whereas preparation costs ran about $3.33 a ton 17 years ago, today's costs hover around $7 to $8, he said.

Kelsey-Hayes Buys J&L Plant

PURCHASE last week by Kelsey-Hayes Wheel Co. of the McKeesport, Pa., plant of Jones & Laughlin Steel Corp. marks the first entrance of a big steel consumer into the Pittsburgh area since the steel industry abandoned its basing point pricing method.

The action partially substantiates the belief of some industry observers that shift to mill pricing may in time mean a migration of steel consumers to steel-producing districts to avoid payment of freight charges to present locations distant from mills.

The automotive wheel and rim firm, now employing about 6000 persons at its Detroit and Jackson, Mich., plants, expects eventually to employ 1500 at McKeesport.

The plant will be occupied by its new owner by Oct. 1, although J & L plans to continue making river barges and mine cars in some sections of the facility until Aug. 1, 1949.

Swing to Mill Pricing General

Virtual complete abandonment of multiple basing point quoting in steel industry indicated by end of summer as additional producers follow U. S. Steel's lead

WITH additional steelmakers adopting mill pricing, abandoning the historic basing point system, indications are that before the end of the summer virtually every steel mill in the country, large and small, will be quoting on the new basis.

Impact of the change in pricing method on consumers' costs will be substantial since freight charges formerly absorbed by the mills now will have to be paid by the consumer. This added cost burden, however, will vary between consumers, depending on their proximity to steel production centers. In some cases, buyers may benefit from the change.

Abandoned Reluctantly — The steel industry abandons basing point pricing reluctantly. Without exception steel executives view the change, forced by recent Supreme Court decisions in the Cement and Rigid Steel Conduit cases, as a backward step. The steel men point out that abandonment of the multiple basing point system will:

1—Promote local monopolies.

2—Restrict competition between the steel mills.

3—Force the closing and relocation of mills and factories.

4—Curtail development of low cost production and distribution.

5—Deny consumers a free choice of suppliers.

6—Lead to geographical concentration of industry.

7—Cost customers more money because of increased transportation charges.

8—Prevent establishment of consumer cost estimates prior to actual purchases.

9—Result in higher prices on finished products to the ultimate consumer.

10—Create confusion and uncertainties in the marketing of steel products which will have chaotic effects on the economy of the nation.

See Growth Hampered—It is the firm conviction within the steel industry that under mill pricing the industrial growth of the nation will be hampered. Ben Moreell, president, Jones & Laughlin Steel Corp., in a letter announcing his company's policy, said: "The nation's basic industries and their customers cannot continue the vigorous growth which is essential to the preservation of our country's industrial strength."

All that the steel companies seek, he said, is the right to compete, and in order to restore this basic principle he held it is essential that Congress amend the laws so there will be no statutory prohibition against charging lower mill prices to some customers than to others, when such lower prices are necessary to permit products to be sold in a distant market to compete with another producer more favorably located.

Legislative Action—It was apparent last week that both producers and consumers of steel are banking heavily on some legislative action which will permit at least partial restoration of the basing point system. However, indications in Washington were that if anything at all is done along this line, it will be months in the making.

Senator Homer Capehart (Rep., Ind.), chairman of a special subcommittee investigating effects of recent Supreme Court decisions on basing point pricing, last week indicated that length of the special session of Congress would determine whether hearings get under way before fall. If the special session is prolonged

DUST FREE SWEEP: Litter and heavy dust is thrown forward into a removable dirt hopper while light dust is sucked from top of brush compartment into a fabric bag as this power sweeper developed by G. H. Tennant Co., Milwaukee, sweeps up to an acre of floor per hour. Powered by a 6 horsepower air cooled gasoline engine it can sweep at speeds up to 6 miles per hour clearing a path 36 inches wide

two or three months (which seems unlikely) hearings of the subcommittee probably would get under way. In any event the most that can be expected in the near future are hearings, any possible legislation being deferred until the next Congress.

Meanwhile, full play of the market under the new pricing system will permit more realistic judgment of the effect of the pricing change on the economy. While there is considerable talk of fabricating plants moving closer to steel production, for the most part it is believed fabricators will not be in a hurry to pick up their shops and move. Extent to which truck and water transport can be utilized in offsetting increased rail freight costs is a matter which thousands of fabricators will look into before they decide upon such a costly proceeding as moving their plant—lock, stock and barrel.

FTC Fears Merger Increase

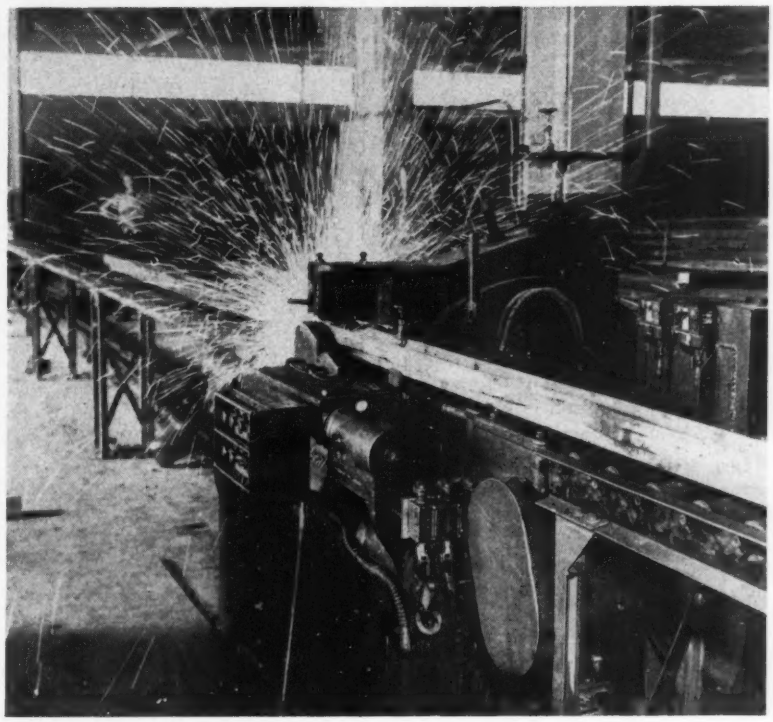
TREND toward business mergers, which may be accentuated in the steel industry by shift to mill pricing, has been in progress since 1940, and has already resulted in the disappearance of more than 2450 formerly independent manufacturing and mining companies, according to the Federal Trade Commission. These firms held assets aggregating some $5.2 billion, or more than 5 per cent of the total assets of all manufacturing corporations in the country.

Federal Trade Commission points out that its recent basing point victory in the cement case will be largely nullified because of the consolidation trend in that field. A loophole in the Clayton Antitrust Act allows this and other industries to acquire assets of a firm, although not the capital stock of a company, engaged in interstate commerce.

Mergers Frequent—Merger activity, which was also high in 1897-1905, 1919-1921, and 1928-1929, turned sharply upward with the end of World War II and has continued through 1947. The movement has extended to virtually all phases of manufacturing and mining, but has been most conspicuous in food and beverages, textiles and apparel, chemicals, nonelectrical machinery, petroleum and transportation equipment.

More than 70 per cent of the total number of firms acquired during this period have been absorbed by larger corporations with assets of over $5 million. Small firms, with less than $1 million of assets, have made only 11 per cent of the acquisitions. Of the companies acquired, 93 per cent bought out since 1940 held assets of less than $5 million; 71 per cent had less than $1 million of assets. Of the nation's 200 largest manufacturing corporations, 123 have made corporate acquisitions since 1940,

External Growth — In what the FTC report describes as "external growth," that is, growth by purchase of competitors, the steel industry affords an example of such expansion. During the period, 1915-1945, says the report, eight major steel firms acquired 153 other companies, and approximately one-fourth of the overall growth of these major steel firms was due to external expansion. This survey does not include U. S. Steel Corp., formed in 1901.



SIDERAIL BUTT WELDER: Typical of the precision equipment employed in the manufacture of trailer sections at Fruehauf's new Avon Lake, O., plant is this machine. It automatically butt welds siderails, joining separate sections into one-piece rails by pressing them together, charging with electrical current and melting them together

ASME To Conduct Price Survey

NATIONWIDE industrial survey on high prices, with emphasis on possible long-range effects on prices resulting from the shifts to mill pricing, will be undertaken by the distribution committee of the American Society of Mechanical Engineers.

Chairman of the committee is Fenton B. Turck, president of Turck, Hill & Co., industrial engineering firm. He said his committee would be solely concerned with the assembly of factual material and invites the co-operation of qualified companies and organizations. The survey is scheduled for completion this year, and will be available on request.

Defense Troubles Ahead

HOW will the U. S. government's preparedness program affect industry?

That's the question West Coast business leaders are asking most frequently. The answers are not clear, but there are ominous clues.

For example, John A. McCone, speaking at a business conference at Stanford University, pointed out recently that the needs of the revitalized defense program will exert a tight squeeze on many basic materials, the result of which will be to bring cutbacks in industries producing less essential goods.

Points to Steel—As an illustration he pointed to carbon steel, already in short supply. The new defense programs, he estimated, will call for about 7½ per cent of the total supply now available.

Copper, he believes, will be affected more critically than any other nonferrous metal, as defense needs will take 20 per cent of the available supply. However, almost all nonferrous metals will be affected severely, because we depend on the rest of the world for a large part of the

supply and therefore the U. S. must stockpile huge amounts of metal.

Another factor affecting industry will be tightening labor supply.

More Steel Allocations?

Commerce officials think they have gone as far as possible under Law 395 as it stands

COMMERCE Department officials, wrestling with the steel allocation problem through voluntary agreements under Public Law 395, think that shortly they will have gone about as far as they can go under the law in its present form.

They already have effectuated agreements, or are about to do so, calling for allocations at the rate of 431,732 tons monthly, or 5,420,784 tons annually. Programs in the discussion stage call for an additional 150,000 tons monthly.

Expect More Requests—More allocations requests are expected, particularly since the steel mills, in making room on rolling schedules for allocated tonnages, have been forced to cut down shipments to customers not covered by allocations.

Consequently, Commerce officials maintain that if Congress intends to stick to voluntary methods of controlling distribution of scarce materials Public Law 395 must be extended and broadened. They want extension beyond the present expiration date, Feb. 28, 1949, and they desire inclusion of a provision which will permit issuance of use limitation orders. Also they desire a formula from Congress by which they may use their judgment in determining use essentiality, and they also want clear authority to borrow competent men from industry on a $1-per-year or some similar basis to help administer the program.

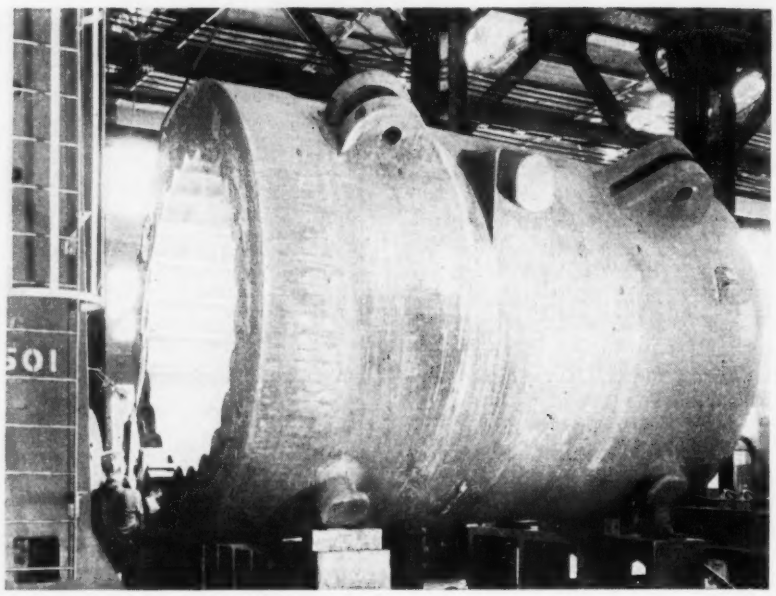
May Spell Trouble—This situation is one that may spell increasing steel procurement trouble for consumers.

One government official last week remarked to a representative of STEEL that the nation now is getting close to the situation that prevailed in 1940 and 1941. The chief difference, he said, was that we now are coping with shortages that did not exist in those years.

Seeks Limitation Authority—While no need for drastic action exists today, he continued, there is no telling when the need for such may arise.

Of the numerous shortage complaints coming to Washington, those of the warm air heating equipment manufacturers are of particular interest since this industry has been granted allocations for housing.

But there are many complaints from other industries suffering because of the allocations program. These are bringing home vividly the fact that whenever a ton of steel is provided for a new customer or for an enlarged use, that steel must come from the allotment of some other consumer. Truck-trailer manufacturers, for example, have been using 200,000 tons annually in building 60,000 trailers. Now their steel deliveries are falling off and unless they get allocations assistance, 1948 trailer production will be between 40,000 and 50,000.



JUMBO MOLD: Ingots weighing 233 tons are poured in huge molds like the one above being machined at the Bethlehem plant of Bethlehem Steel Co. To cast the mold requires 225 tons of pig iron, and the mold stripped and cleaned weighs 180 tons. The huge ingots are used in forging pressure vessels, generator parts and such pieces as the members for the two 2000-ton cyclotron magnets recently produced at the plant

Allocations Picture—Here is the steel allocations picture as it stands today:

Allocations in effect call for monthly shipments as follows: **Freight car construction** 250,000 tons; Atomic Energy Commission construction, 20,000; warm air heating furnace manufacture, 29,000; prefabricated housing, 8430.

Allocations tentatively agreed on and to become effective after public hearings in August call for the following tonnage shipments monthly:

Armed services, 105,273; **oil field tank and production equipment,** 16,529; **wet and dry cargo barges for inland waterways,** 20,000; **equipment for and maintenance of anthracite coal mines,** 2500.

Additional programs under discussion: **Shipbuilding:** indefinite but expected to include one large passenger liner and a number of fast tankers; tentatively estimated to require 250,000 tons through Feb. 28.

Large petroleum storage tanks for construction at terminal points, and small petroleum storage tanks for filling stations, manufacturing plants, farms, etc., tentatively estimated at 300,000 tons through February.

Machine tools: Nothing definite yet requested but the Munitions Board may seek an allocation for special machine tools.

Truck-trailers: Allocation program based on 200,000 tons of steel annually is a possibility.

Agricultural machinery: While this industry turned down a proposal to allocate its steel, the worsening outlook for steel availability may lead to a reconsideration.

Marshall Plan: The Economic Cooperation Administration expects to submit request in August.

Bituminous coal: Preliminary report puts steel needs for equipment and maintenance at 682,900 tons.

OIC Steel Plans To Get Hearings

FOUR proposed voluntary steel allocation plans will take another step this week in their evolution from proposals to operating programs. The blueprint for military steel will get a public hearing Aug. 3; a hearing on the project to make steel available to the oil field tank and production equipment industry will be held Aug. 4; the hearing on the plan

to make steel available for construction, conversion and repair of barges and towing vessels is slated for Aug. 5; and the voluntary plan for steel for the anthracite coal industry will be publicly aired Aug. 6. All hearings will be held in the Commerce auditorium, Washington.

Stainless Use Increases

USE of stainless and heat resisting steels has been increasing rapidly. Nine years ago production in the United States totaled 180,000 tons of ingots. But in 1947, according to the American Iron & Steel Institute, output was approximately 520,000 tons of ingots with production of stainless products at a record 333,000 tons.

Modern stainless and heat resistant steels stem from long and intensive search for steels to withstand corrosive attack, retain sufficient strength over wide ranges of temperatures, and permit fabrication into desired products.

Cannon Research—One of the early stainless steels was a by-product of cannon research. Attempts to make better cannon linings from steel containing chromium led to the discovery of chromium's remarkable property of rendering iron and steel rustless or stainless. During a laboratory investigation of these linings in 1913, the English metallurgist, Harry Brearley, observed their resistance to attack by various reagents. Brearley, who died recently, suggested use of the new steel for cutlery.

After years of research, knives of steel containing about 12 per cent chromium and 0.30 per cent carbon were developed which took and held a sharp edge and resisted corrosion. Additional research revealed a tight self-healing protective film of chromium-iron oxide on the knife makes it "stainless." The protective oxide is so thin and transparent that it escapes detection by the unaided eye. When scratched, nicked, worn through or otherwise penetrated, a fresh protective film forms practically instantaneously.

Chromium is an important constituent of every stainless and heat resisting steel. It strengthens steel and increases its corrosion resistance.

Various combinations of any of 17 other elements may be present in modern stainless and heat resisting steels. These are aluminum, carbon, columbium, copper, iron, manganese, molybdenum, nickel, nitrogen, phosphorus, selenium, silicon, sulphur, titanium, tungsten, vanadium and zirconium.

Steel Engineers Slate Meeting

PEACETIME technological developments and equipment advancements of the iron and steel producing industry will be featured at the Iron & Steel Exposition to be held Sept. 28-Oct. 1 in Cleveland's Public Auditorium by the Association of Iron & Steel Engineers.

More than 2000 exhibitors will display at the show, and 40 papers or discussions will be presented at the technical sessions.

Tool Engineers Meet Oct. 11-13

EXPANDING West Coast industry, and its relation to the Pacific tool industry, will be studied at the semi-annual convention of the American Society of Tool Engineers which meets Oct. 11-13 in the Biltmore Hotel, Los Angeles.

New tooling aspects in the aircraft and petroleum industries will be featured at the technical sessions. Another part of the convention program will include tours of leading industrial plants in the Los Angeles area.

Calendar of Meetings . . .

Aug. 10-13, First Western Packaging Exposition and Conference: San Francisco Civic Auditorium, San Francisco.

Aug. 24-27, American Institute of Electrical Engineers: Pacific general meeting, Spokane, Wash. Institute headquarters are at 33 W. 39th St., New York.

Aug. 30-Sept. 3, American Chemical Society: Eastern section of annual meeting, Washington, D. C. Society headquarters are at 60 E. 42nd St., New York.

Sept. 6-10, American Chemical Society: Midwest section of annual meeting, St. Louis. Society headquarters are at 60 E. 42nd St., New York.

Sept. 7-20, Department of State: First inter-American conference on conservation of renewable natural resources, Denver.

Sept. 9-10, American Ceramic Society: Fall meeting, Hotel Conneaut, Conneaut Lake Park, Pa. Society headquarters are at 2525 N. High St., Columbus, O.

Sept. 13-17, American Chemical Society: Western section of annual meeting, Portland, Oreg. Society headquarters are at 60 E. 42nd St., New York.

Sept. 13-17, Instrument Society of America: Third instrument conference and exhibit, Convention Hall, Philadelphia. Society headquarters are at 1117 Wolfendale St., Pittsburgh.

Sept. 20-25, American Mining Congress: Metal mining convention and exposition, San Francisco. Congress headquarters are in the Ring Bldg., Washington.

Sept. 23, American Iron & Steel Institute: Regional technical meeting, Hotel William Penn, Pittsburgh.

Sept. 28-Oct. 1, Association of Iron & Steel Engineers: Annual convention, Public Auditorium, Cleveland. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

Sept. 29, American Iron & Steel Institute: Regional technical meeting, Hotel Cleveland, Cleveland.

Oct. 4-11, American Institute of Steel Construction Inc.: Twenty-sixth annual convention, Chateau Frontenac, Quebec, Canada. Institute headquarters are at 101 Park Ave., New York.

Tool Sales Level Rises

NMTBA index of orders for first half surpasses 1947 period by 9 per cent. Preparedness helps

NO CLEAR-CUT trend in machine tool ordering volume is apparent. From company to company, reports of activity vary, some claiming July volume compared favorably with June, and others saying sales were off by virtue of vacations in potential customers' plants. National Machine Tool Builders' Association index further illustrates the mixed tendencies of the market; the setbacks in ordering which occurred in February and again in May have been separated by fairly good volume months, relative to 1947. In the first six months, in fact, the average level of ordering was 9 per cent higher than in the comparable 1947 period.

In June the sales index stood at 81.8 per cent of the 1945-47 average, compared with 73.5 per cent in May, and an average level for the first half of 81.4 per cent. The association's index of shipments, nominally for the month of May but actually weighted with the shipment volume for March, April, May and June, moved upward to 86.6 per cent of the 1945-47 average, the highest point since January.

Preparedness Cited — As a rule, companies which reported July sales at a reasonably good level were those which have begun to get a trickle of orders from armament contractors. And conversely, those reporting declines have not yet received the shot in the arm from the military program. As yet no sizable volume of ordering is attributed to this program, but recent speed-up in aircraft procurement will soon filter down to most builders' levels.

As far as foreign sales are concerned, the Economic Co-operation Administration's plans for relief, rehabilitation and recovery have been preoccupied with the first phase, according to builders. European countries, which must decide how their aid grants are to be spent, the builders say, are slow to look beyond the immediate relief features of the program to the more permanent aspects. Then, too, dissension by domestic industries, which hate to see potential business taken from their countries and given to American firms, is also slowing up action on the monetary allocations. Realization seems to be dawning in many of the participating countries, however, that the need for tools is immediate and that these needs will begin to be satisfied with some portion of ECA credits before too much longer.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

President seeks to hold Congress in inelastic straitjacket in special session. Muzzles department heads in attempt to hold debate to measures emanating from White House

EMPHASIZING the inelastic legislative straitjacket in which President Truman is trying to hold this special session of Congress, a muzzle has been placed over the mouths of department and agency heads.

They may not approach Congress for any legislation they may need in order to carry out their responsibilities in the public interest.

An unprecedented order by Budget Director James E. Webb, issued on instruction from the President, made it clear that the only requests to be made during this special session will be those emanating directly from Mr. Truman.

Avoid Proposals — "It is his (the President's) desire to avoid the submission of proposals which can be held for the consideration of the 81st Congress, thus enabling the reconvened 80th Congress to complete action on his recommendations at the earliest practicable date . . . Therefore, except for legislative proposals designed to carry out the President's recommendations, it would not appear appropriate for the departments and establishments of the executive branch to submit other legislative proposals to the Congress in this session," read Mr. Webb's order in part.

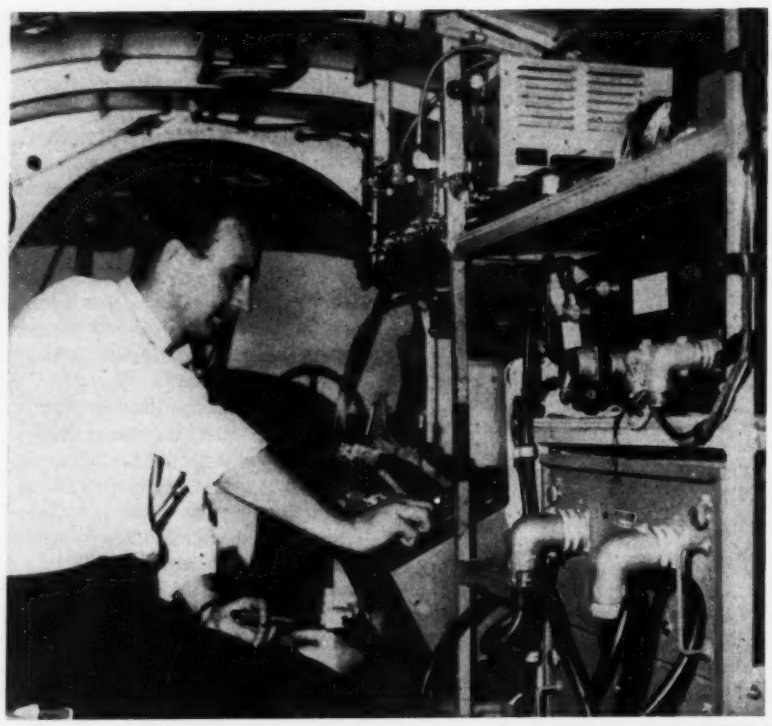
This will not affect such reports and testimony as may be called for by committees or members of the 80th Congress. However, Mr. Webb's order goes on, such reports and testimony will have to be cleared through the Bureau of the Budget "for advice as to the relationship of the legislation to the program of the President . . ."

Not a Novelty — There is no novelty in this clearing of reports and testimony to be submitted to Congress by government brass hats, for it is done automatically under a system provided in Budget Circular A-19 of Sept. 25, 1946, which was created to give the President necessary checkrein over all his subordinates in the administrative branch. The new thing is the issuance of the reminder that bureaucrats will be permitted no leeway under the rule. It will hold good even in the case of government heads called before congressional committees, for when subjected to questioning they will have to be careful to stick to the President's line.

This is unfortunate, for in many cases experienced government officials are in a position to help Congress out of a dilemma by suggesting policies which, while not in line with the White House formula, would afford practical solutions to present difficulties.

Commerce Department officials, for example, have had a vast amount of experience in utilizing the voluntary allocations agreements procedure as an anti-inflation device. They think that this procedure, if garnished with a few trimmings, would serve effectually to prevent further inflation due to materials shortages. Public Law 395 would serve for an indefinite period to come, they feel, with these changes: 1—Authority to negotiate voluntary allocations agreements should be extended beyond next Feb. 28; 2—authority should be provided to issue use limitation orders and thus hold consumption of scarce materials, particularly steel, within the confines of current production; and 3—authority to borrow competent men from industry on a dollar-a-year or some comparable arrangement.

Whether, under the gag order, they will have a chance to advise Congress on the basis of their experience remains to be seen.

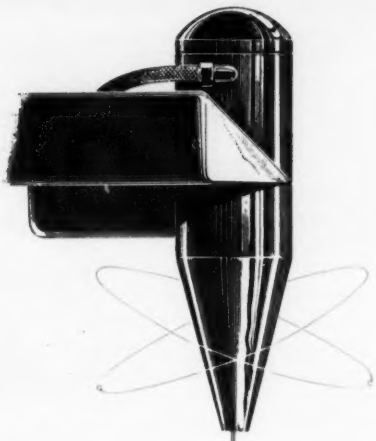


PROSPECTING BY PLANE: Geologist W. J. Dempsey surveys ore deposits in Colorado by airplane. Instruments indicate the presence of minerals even though they are as much as 500 feet underground. NEA photo

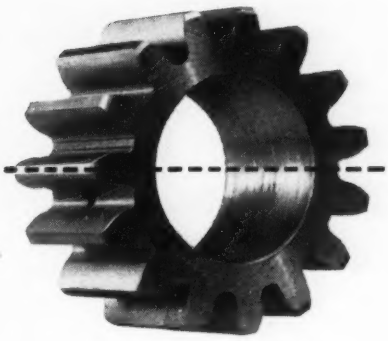
Wish Fathering the Thought

MAJOR omission in the President's expression, both to Congress and the public, is an accurate labeling of the Berlin situation for what it is. His statement that the chances for world peace are excellent is held by many well-informed government insiders as an example of the wish being father to the thought.

This writer attended the press conference of General Lucius D. Clay just prior to his return to Germany—and found nothing specially encouraging in it. In it General Clay followed strictly the line expressed by Secretary Marshall the preceding day—that it is the policy of the United States to exhaust the resources of diplomacy and negotiation with Rus-



an eye for a tooth



The eye does it: the electronic temperature control in the Cincinnati Flamatic Hardening Machine keeps constant watch over surface temperatures, gives you better control of the finished product, lower distortion, and best uniformity with high production than ever before practical with flame hardening . . . Place the gear (other work – pinions, shafts, cams, etc.) on the spindle, press the button, and Flamatic does the rest: quickly heats the surface with oxy-acetylene flames to within plus or minus 5°F of preset temperature, followed by oil quench. Maximum surface hardness can be developed with negligible distortion and without affecting core properties . . . Considering size capacity, versatility, and productivity, Flamatic is definitely low in cost. Check Flamatic for your specific surface hardening requirements.

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sia and that the United States will do everything in its power to prevent the outbreak of another war. General Clay reiterated to the newsmen present that the United States and the western allies will continue to insist on their right to remain in Berlin.

Danger Lurks — The regrettable result may be failure on the part of Congress to take some actions which it might approve if this special session had been called in the name of an emergency, or semi-emergency, but which it would deny on the basis of normal political considerations. Denied of spontaneous assistance from informed government officials and eager to get back home to prepare for the November elections, Congress probably may fail to inform itself of the full danger of the situation abroad and hence fail to enact legislation which should be passed without delay.

In a nutshell, in the opinion of many governmental officials, this special session should have been called for enactment not only of legislation needed for the moment, but of standby measures for full-scale mobilization of the nation in case of another war.

Old Axiom Preserved by Vetoes

PRESERVING the old axiom that it is hard to collect money from the government, an unusually large number of the private relief bills voted by Congress to individual citizens and corporations have been killed by President Truman by the "pocket veto" device.

One of these would have authorized payment of $2100 as liquidated damages withheld by the Navy from the East Coast Ship & Yacht Corp., Noank, Conn., in paying for repair work done in 1934. In asking for remission of the liquidated damages, the contractor claimed it had to perform extra work, but the government claimed the delay in completing the job resulted from the contractor's failure "to prosecute the contract work with diligence, efficiency, and with a proper regard for its contractual obligations."

Steel Capacity Report Out Soon

ANALYSIS of factors that currently prevent full utilization of existing iron and steel capacity shortly will be issued in the form of a report by the National Security Resources Board. It will be from the pen of R. J. Wysor, formerly president, Republic Steel Corp., and now a member of the board's advisory staff. The Wysor report will dwell to a large extent on the nature and extent of the ferrous scrap shortage.

Incidentally, the NSRB appears to have abandoned its study of a proposal for further comprehensive iron and steelworks expansion. This, it will be recalled, included a potential of a government-owned standby plant to be located at some tidewater location, and to have capacity for 10 million tons of ingots annually and to be operated on foreign iron ore stockpiled for an emergency. The behind-the-scenes military view is that conditions generally do not warrant serious consideration of a major steel works expansion program under the circumstances now prevailing.

Steel Industry Study Deferred

IMPOSSIBILITY of intelligent evaluation at this time of the long-range significance of the cement and glucose decisions, and of the present action of the Federal Trade Commission, on the future pricing methods of the steel industry has caused the Commerce Department to postpone indefinitely the completion of its comprehensive iron and steel book.

This was to have been a complete factual treatise on this industry, with particular emphasis on its capacity, its technological development, its raw material, financial and organizational status, and its relationship to the country's general economy.

The project has been deferred at least until the fiscal year ending June 30, 1950.

Trade Secretaries Get Hearing

EVEN though the Justice Department continues to disapprove of the participation of trade association executives in government conferences with industry, Commerce Department may decide to open to trade association men the meetings held by its Office of Industry Co-operation with the industry committees consulted on voluntary allocations programs under Public Law 395.

Secretary Charles Sawyer will hold a conference with trade association executives in August to hear their views; however, there is no assurance that he will reverse the policy laid down by Henry A. Wallace and followed by W. Averill Harriman when they occupied the post.

Report Opposing Views — Commerce officials who recently have explored the situation say they encounter opposing views among the trade association men. Some think that they should be permitted to attend, not only to furnish information in the meetings, but to report developments to industry members not invited to attend. Others think that their attendance at meetings such as those at which voluntary allocations programs are laid down might be improper and embarrassing.

Drafting Renegotiation Rules

FOR purposes of carrying out the Renegotiation Act of 1948, Defense Secretary Forrestal has made provision for a Military Renegotiation Policy & Review Board which will report to him through the Munitions Board. Its members are to be named later.

In the meantime, an ad hoc committee composed of Under Secretary of the Navy Kenney, Under Secretary of the Air Force Barrows and Assistant Secretary of the Army Gray has prepared a tentative draft of renegotiation regulations. The latter, however, will not become operative until reviewed by the Military Renegotiation Policy & Review Board.

In view of the wide latitude given the secretary of defense in deciding to what extent contracts will be subject to renegotiation, and the need for drafting regulations acceptable alike from the standpoints of contractors and the public interest, some delicate controversial questions must be settled before the proposed regulations can be put into effect.

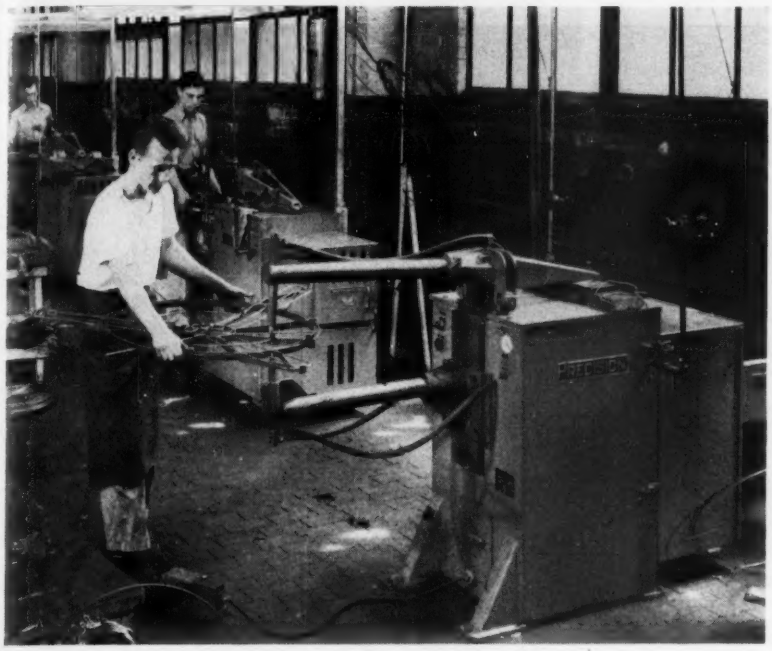
Booklet Discusses Plant Sites

INDUSTRIAL companies interested in building new plants or relocating them should write to the National Security Resources Board, Washington 25, D. C., for a copy of a new booklet, "Strategic Considerations in Industrial Locations."

In a nutshell, greatest degree of security against bombing attacks will result from dispersion of industry. It dwells on this point in discussing plant locations with reference to the ultimate in bomb attacks, namely, use of the atom bomb.

No country in the foreseeable future will ever have enough atom bombs to bomb any but the most important industrial centers, namely, those greater than five miles square. It therefore is strategically desirable to plan industrial expansion so that further urban concentrations of more than 50,000 people may be avoided. Allowing for future developments, it is not expected that an improved atom bomb would cause heavy damage beyond a distance of three miles from the point of detonation.

The booklet dismisses as impractical for large-scale application the use of underground industrial sites.



PLUG-IN WELDER CONTROL: Nonsynchronous electronic controls on the rear of these standard rocker arm welders time and sequence each weld on the fan guards shown in production. The sequence timer, made by Westinghouse Electric Corp., Pittsburgh, is plug connected for easy removal. It calibrates in cycles the functions of squeezing, welding, holding and turning off the welder. Control may be set for the particular job by adjustment dials on the cabinet door. Voltage regulating tubes take care of fluctuations on welder circuits

German Price Rise Seen

Higher costs not entirely offset by economies from larger output. Capacity studies undertaken

DUSSELDORF, GERMANY

INCREASE in German steel production notwithstanding, steel prices will again be boosted in the near future. The previous advance was insufficient to cover increased costs, particularly for foreign iron ores which now are coming in in quantity. Scrap prices have also been boosted as have those for coal, Ruhr coal now costing 7.5 marks more per ton.

The expected steel price increase will amount to $3.60 per ton on raw steel and about 3 to 5 per cent on finished products.

One result of the currency reform has been a favorable change in attitude on the part of all workers, and this, coupled with the improved supply of higher grade foreign ores, boosted steel output in June to 377,000 tons. July production was expected to set a new postwar record of 400,000 tons. This total would assure output of 280,000 tons of finished steel.

Many bottlenecks to steel production have disappeared, although the shortage of coking coal still is serious. Imports of Swedish high grade ores are possibly the most important factor in the increasing steel output rate, and contracts for 1,750,000 tons have been placed for 1948.

Industry Under Study — Detailed questionnaires have been sent out by the American steel commission to German steelmaking firms to determine the optimum capacity use for attainment of at least a 10.7 million ton production annually. These questionnaires will provide information for the commission to use in setting up three "yardstick" plants—one large, one medium and one small —against which to calculate the overhauls which will be necessary before the proposed production goal can be realized.

Studies by the commission already indicate the wastefulness of the present setup of nonintegrated steel mills, its investigations pointing out that steelmaking costs are $40-50 a ton higher because of the deconcentration policy. Separation of coal mining activities from steelmaking has also had the effect of retarding production.

This commission is also understood to be seriously considering ways to increase German production above the 10.7-million-ton level in order to enable the Ruhr to ship semifinished steel into neighboring countries.

Belief is growing that German domestic needs will take all of the envisaged 10.7 million tons, and that about two million additional tons should be produced for export.

Belgian Strike Cuts Output

LIEGE, BELGIUM

PRODUCTION in the Belgian iron and steel industry is being maintained at a satisfactory level, although a slight decline has been noted. Output of steel ingots and castings was 306,650 metric tons in May compared with 336,310 tons in April. Production in June was further hampered by a strike of five days' duration, and actual losses in the month may amount to about 10 days' output. July operations were much improved and production may have reached about 320,000 tons.

Coal output in May was 2,062,715 metric tons and in June rose to 2,285,151 tons. Output of coke in June was 415,000 tons. This production was below the usual level, having been influenced by the strike.

Saar Output Rises — Because the steel industry in the Saar was an important competitor of Belgium even in the domestic market, significance is being attached to the revival of activity in this section. Steel ingot production in the Saar rose to 703,900 metric tons in 1947 from 202,700 tons in 1946. Rolled steel output reached 571,300 tons in 1947 from 235,400 tons in 1946. Of the district's 30 blast furnaces, only four operated in 1946; 1947 saw nine in operation. Twenty basic bessemer converters are located in the region, but of these only five operated in 1946 and ten in 1947. There are 15 open hearths, of which three poured steel in 1946 and five in 1947. One of the district's four electric furnaces operated in 1946 and 1947.

From these figures it may be concluded that the capacity of the Saar is employed at about 30 per cent now, with production on the rise. It has been estimated that a maximum of five years will be required before industry there regains its prewar operating level.

Modernization and reconstruction of the Belgo-Luxemburg steel industry is entering its active phase. Two new blast furnaces and one 90-ton Siemens-Martin furnace are under construction in the local area. Near Charleroi three blast furnaces and one 120-ton Siemens-Martin furnace are to be erected.

Ore-bearing rock is blasted to size that can be handled by shovel and crusher. Some rocks must be drilled and blasted individually . . .

. . . After being crushed to desired fineness, rock is carried on long belt conveyor, below, to separating plant for further processing . . .

J&L Pushes Development of New York Iron Ore Mines

Eight hundred thousand tons of sintered ore to be shipped from Benson Mines this year. Production will be increased to offset dwindling Mesabi reserves

RAPID exhaustion of the rich iron ores of Minnesota's Mesabi range has led Jones & Laughlin Steel Corp. to start intensive development of its large open quarry mine for magnetic ore at Star Lake, New York.

Already contributing more than one-eighth of the total iron ore used by the company, the expanding Benson Mines are destined to become an even more important source for the metallic within the next decade.

Last year more than 650,000 tons of high grade ore were produced at the mine. Output this year will reach 800,000 tons. Reserves of ore at the Benson Mines are large and are expected to provide increasing quantities in the future.

Locked in Rock — The magnetic ores at the Benson Mines differ from the Mesabi ores in several respects. Instead of the rich red "dirt" containing iron found in Mesabi, the lean iron ores at Benson are locked into a very hard rock.

To obtain the ore, this rock must be blasted until the pieces are small enough to be processed through a 350-ton gyratory crusher.

Rock from the crusher is further pulverized by additional crushers, and by rod mills and ball mills, in a "concentrator" building.

Use Magnetic Separators—After the rock is crushed and ground to a sand, the iron is separated from the waste material by magnetic separators. In these separators, huge magnets draw out the iron, and the waste is carried off to a disposal area.

The fine particles of iron which are drawn off in this manner are impractical for blast furnace operation, because they would be blown out of the furnace in the form of dust. Consequently, the iron particles are fused into large chunks.

This sintering is effected by mixing the iron ore concentrate with coal dust, and igniting and subjecting it to intense heat.

The sintered ore is shipped direct to the J & L blast furnaces at Pittsburgh, Aliquippa, Pa., and Cleveland.

Project 10 Years Old—Development of Benson Mines is the result of research begun by J & L geologists nearly 10 years ago. Foreseeing the need for additional reserves, they began investigating the possibilities of iron mining in the Adirondack region of northern New York.

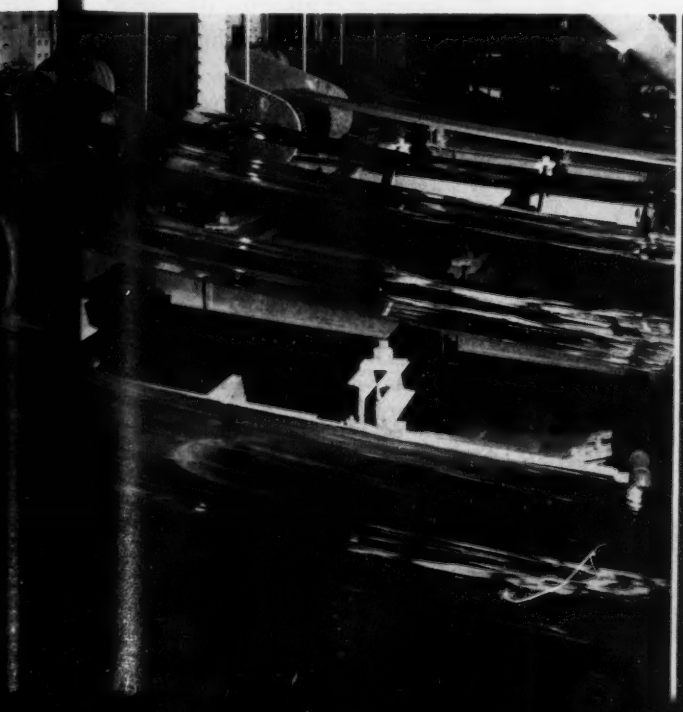
Their search led them to an abandoned mine near Star Lake, where the mine pit and plant, stripped and idle for 20 years, were little more than a ruins. The exploration was fruitful.

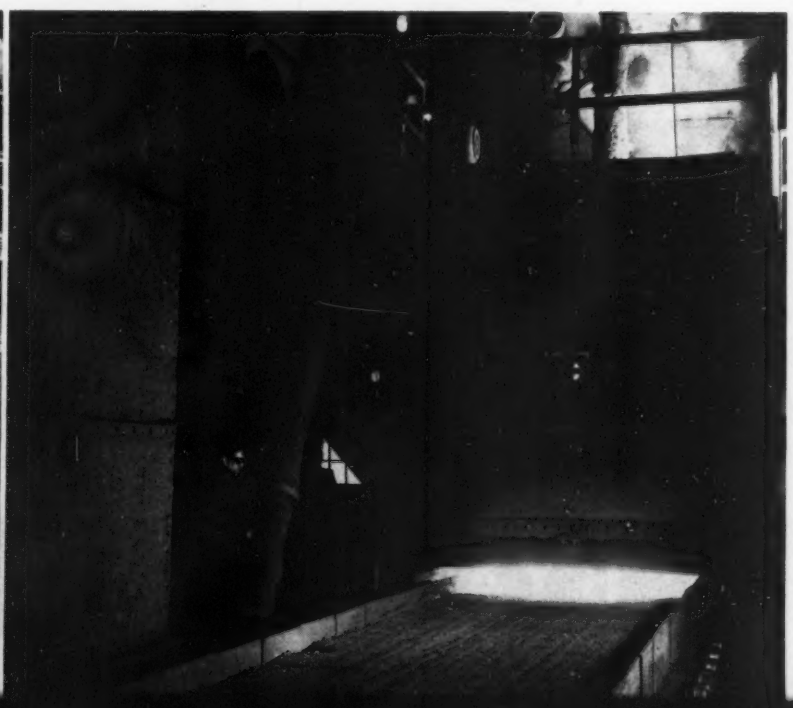
In 1941, J & L leased the land, and construction of the present plant was begun by the Defense Plant Corp. in the fall of 1942, as part of the World War II production program. This plant was purchased by J & L in the fall of 1946.

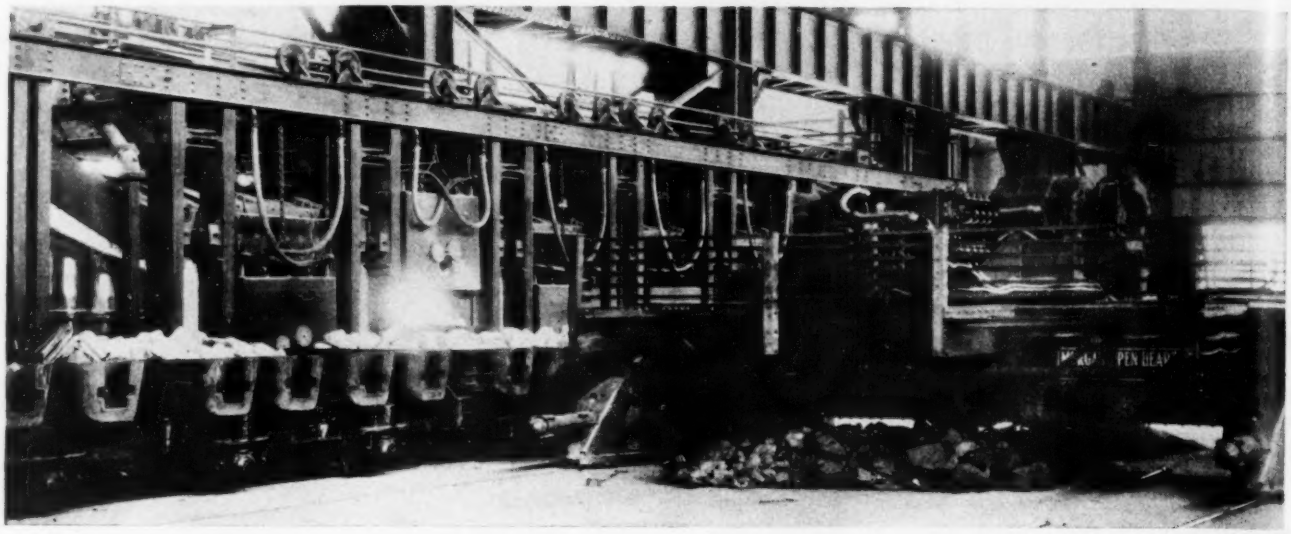
Expansion Underway—Additions to the plant, now under construction at Benson, include: 1) Construction of a new pilot "martite" plant for crushing and concentration of non-magnetic ore which cannot be processed in the magnetite plant; 2) construction of a new garage and maintenance building for servicing and repair of the mining equipment.

. . . Fine particles of iron are separated from the waste material by a magnetic process in these machines. Too fine for use . . .

. . . It is fused with coal dust, or sintered. The sintered ore, shown here emerging from furnace, is ready for use in blast furnaces







IN OPEN HEARTH PLANTS

MORE THAN 90% OF THE INGOT AND CHARGING CARS OPERATE ON HYATTS

Over thirty years ago Hyatt engineers effectively demonstrated that more ingot mold and charging box cars could be handled by locomotives when the plain bearings were replaced by free-rolling Hyatts.

Since that time, advantages, other than power saving, have been proven by performance. The saving in maintenance of locomotives and car equipment alone amply repaid the initial cost of Hyatt bearings.

As a result, today more than 90% of the ingot and charging cars in open hearth plants are operating on dependable Hyatt bearings.

These builders of open hearth cars regularly supply Hyatt Bearings

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The William B. Pollock Company
Continental
Foundry & Machine Company
American Car & Foundry Company
Union Steel Casting Division.
Blaw-Knox Company

STEEL MEN PREFER HYATT BEARINGS

Because:

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2. Cars can be handled more rapidly.
3. More cars can be hauled without an increase in power.
4. The cost of locomotive maintenance is reduced.
5. Wear is reduced and axle breakage virtually eliminated.
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7. Lubrication can be less frequent.
8. Less time is required for lubricating car bearings.
9. Production speed is increased from open hearth to stripper to soaking pits.

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GENERAL MOTORS CORPORATION
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HYATT ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Oldsmobile to start production of high-compression V-8 power plant for 1949 models. May bear Kettering's name but is not ultimate engine envisioned by GM researcher

DETROIT

OLDSMOBILE'S new so-called Kettering Engine Division is swinging into high gear on its program for putting a high compression V-8 power plant into production for 1949 models. Machine tool equipment of the latest types is being shipped to Lansing. Gray iron casting work is being placed with several of the General Motors foundries — blocks to Chevrolet in Saginaw, exhaust manifolds to Buick at Flint, other elements to the Central Foundry Division at Danville, Ill. Forged components can be produced in the elaborate Olds forge plant, a show spot in the forging field since before the war.

It is reported the Kettering name will be embossed on a number of the parts going into the engine, despite the fact Mr. Kettering himself is not too happy over the identification, for several reasons. First, the engine is not the one described by Boss Ket before the SAE meeting in June, 1947, by a long shot, and second, the engine he did describe was the culmination of years of tests by a group of engineers in the General Motors research laboratories, under Kettering's direction of course, but not a personal creation of the research expert.

Compression Ratio Raised—GM researchers and their former boss, who is now officially retired but still a much sought-after consultant, regard the "Kettering engine" appelation as primarily an advertising department stunt designed to capitalize on the name of a famous personality. Compression ratio of the unit will be approximately 8.5 to 1, against 7 to 1 of the former Olds 8, and it presumably will not require the special high-octane fuel used in the GM test engine which had compression ratio of 12.5 to 1 and showed a 30 per cent improvement in fuel economy. The current Olds program is looked upon more as a complete retooling for a new production engine, rather than a venture into the field of a radically different power plant. There is even some question voiced over whether the Olds engine is of suitable basic design for eventual modification into the type which GM researchers tested so successfully.

Oldsmobile, along with most other manufacturers, is overdue for a new engine. Present designs have been basically unchanged for 20 years or more. Production facilities wear out and become uneconomical despite constant efforts to assimilate latest developments in tooling. At some point there comes a time when the best policy is to develop a completely new manufacturing sequence, every element of which embodies efficient and economical techniques, whether they be milling, broaching, drilling, reaming, grinding or just material handling.

Olds has now embarked on such a program, with the aim of organizing equipment in such a way that when the truly high-compression engine does come along it can be taken more in stride. For the present, the change involves a shift to a V-8 design and a 20 per cent increase in compression ratio. When compression moves on up to the point where 100-octane fuel is required and where such fuel is available generally, then it will be time to introduce the necessary further features like cooling of pistons, valves, combustion chambers, inlet air, etc.

Foresaw Orderly Progress—A quote from Kettering's memorable paper on the subject is in order. He said: "There is no doubt about the large savings that can be made by increasing the compression ratio of engines to utilize high-octane fuels. How rapidly they can be incorporated into the products is a problem requiring much engineering co-operation and development . . . While it would not be possible for the automobile industry to retool entirely to obtain the full advantage of 12.5 to 1 compression ratio in any year, neither would it be possible for the oil industry to shift overnight to the production of high-octane fuel. In designing new engines it is possible to incorporate such factors that compression ratios can be increased in succeeding models without the necessity of complete retooling. Then, by increasing the compression ratio in step with the fuel, it will ultimately reach the maximum value. The changes can come as rapidly as automotive engineers and petroleum chemists learn how to commercialize the possibilities . . . While it is recognized the trend toward higher compression ratio must be gradual and orderly, it is believed that this trend possibly may be accelerated greatly if the required correlation between fuels and engines is taken into consideration when making new engine designs for the immediate future."

Little Correlation to Date—Up to this point, there has been little "correlation" of fuels and engines, possibly because oil companies have all they can do to keep abreast of demand for the standard fuels, with little time available to map out a new move into commercialization of high-octane gasolines.

In recent years there has been a gradual increase in compression ratios of automobile engines usually obtained by milling off a little more iron from the face of the cylinder head, so that the volume of the combustion chamber over the piston is reduced slightly, thus giving an increase in compression ratio and horsepower. This was carried so far in one case that instances developed of pistons actually clanking against the tops of combustion chambers in

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1948	1947
January	422,324	366,205
February	399,460	393,636
March	519,133	443,588
April	462,315	445,137
May	359,989	404,191
June	454,388	421,466
6 mos.	2,617,609	2,474,223
July		400,944
August		364,478
September		444,501
October		461,536
November		417,493
December		492,109
12 mos.		5,055,284

Estimates for week ended:

	1948	1947
July 10	98,700	90,075
July 17	120,741	103,091
July 24	117,622	83,867
July 31	110,000	97,712

Estimates by Ward's Automotive Reports

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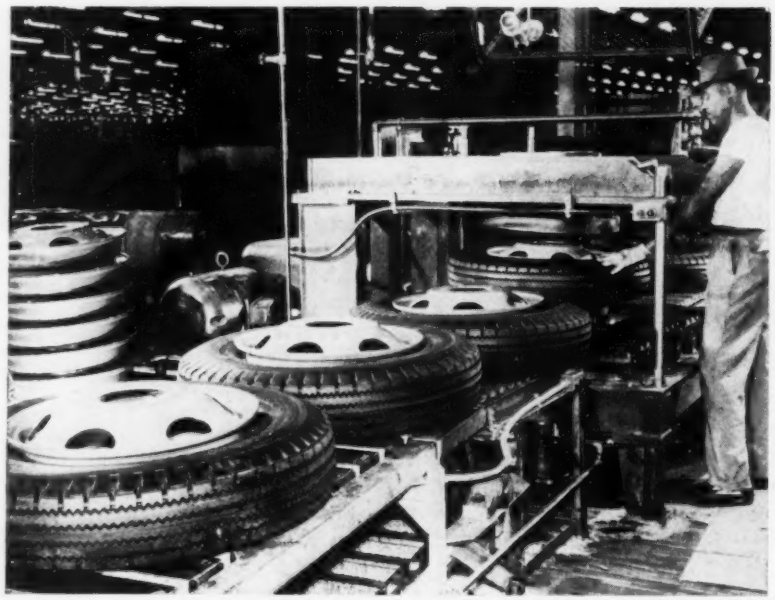


SPEEDS TIRE, WHEEL ASSEMBLY: Studebaker engineers designed a tire and wheel assembly machine to speed this phase of auto manufacturing. Workman at right is operating a hydraulic press, the vertical movement of which locks the rim and wheel clinching edges firmly in a split second operation. Tires and wheels are shown moving on a mechanical conveyor to the press

the cylinder head after a layer of hard carbon had been built up on the tops of the pistons.

No other entries into the field of high-compression engines have been listed as yet. Cadillac was expected to make a move in that direction but apparently will rest with its present V-8 engine which was considerably improved during the war years when installations in combat tanks called for extra ruggedness and high-speed dependability. Buick has been experimenting with what some of its engineers call a Z-block engine, or a staggered arrangement of eight cylinders. Possibilities for production appear remote for the present.

New engines do not look to be in the cards for 1949 models of the Chrysler Divisions which are concentrating attention on revised body designs. Ford made a number of modifications in its V-8 engines, shifted Lincoln from a V-12 to a V-8, seems set for a couple of years with the current power plant. Packard dropped its 6-cylinder engine and added a new straight-8 to the line, giving three in the latter class, all basically of the same type.

Hudson introduced a new 6-cylinder unit recently, rated at better than 120 horsepower and embodying several minor innovations in design and construction. Actually this engine showed so well in tests that it had to be soft-pedaled a little to avoid making the higher-horsepower straight-8 look inferior in comparison.

Major Changes Due

A QUICK look around the passenger car engine field leads to the observation that major changes are long overdue, and in the next five years a number of fresh programs will be launched, requiring appreciable investments in forging, founding and machining equipment.

Packard announced last week it will spend $5-$7 million on new tools needed to build an automatic transmission. Nature of the unit has not been divulged, although the goal of a durable, trouble-free, efficient and economical mechanism is claimed to have been reached. Smooth getaway, no feel of gears shifting, the equivalent of a different gear at the exact time needed, braking action on downgrades and adaptability to the individual driver are other qualifications which were charted when company engineers began a development program 15 years ago. About two years ago, it appeared the time was ripe to move into production, but for some reason manufacturing plans were deferred until this spring.

Chrysler To Spend $75 Million

CHRYSLER CORP. is dishing out approximately $75 million on tools, dies and machinery for its 1949 models, a program which under prewar conditions would have cost only $15-$20 million, according to President K. T. Keller. Master mechanics in Plymouth, Dodge, De Soto and Chrysler plants are working up their changeover schedules and insofar as possible they will be dovetailed into current production so that the first of the 1949s will roll almost on the rear bumpers of the last of the 1948s.

Mr. Keller, speaking at Palo Alto, Calif., July 22, cited some striking figures on the growth of his company over the past quarter-century. It began life with eight plants, employed 10,000 and had assets valued at $37 million. The score now is 30 plants, employing 90,000, with the book value of stockholders' equity placed at $330 million. Value of physical properties is carried on books at $105 million; what the owners of the business actually have invested in plant and equipment since 1925 is a neat $415 million, of which $180 million already has been used up and written off, the balance partly amortized and written down to the book figure. Mr. Keller estimates that under today's costs the full complement of Chrysler plant and facilities would cost at least $750 million to reproduce. The 30 plants, with 22.5 million sq ft of floor space, last year required an average daily purchase of $5 million in materials, supplies and outside services to support operations. Gross intake was $1363 million on which net earnings of 4.93 per cent were realized.

Half Billion in Taxes — Commenting upon the enormous tax burden which industry is called upon to shoulder, Keller said that in the past ten years his company paid over half a billion in taxes, a total which exceeded net earnings for the period in the ratio of 5 to 3, and was more than three times total dividends.

New Frazer Coming

KAISER-FRAZER probably will announce its 1949 Frazer models within the next month, as assemblies of 1948 jobs already are being slowed down. All that this means is that the bulk of production currently is Kaiser models, the two being practically identical except for grilles, decorative moldings and interior appointments. The Frazer is due for a sharp break with the Kaiser in the next series, although the basic resemblance will still be apparent. Sheet metal at the rear will be brought down lower by several inches, to overcome the humped-up appearance of current models.

What's Interesting About UNION CHAIN'S Raw Materials?

Union Chains for Every Application

Drive and Conveying Chains and Sprockets

- Bridge Chain
- Combination Malleable Iron and Steel Chain
- HB (hardened bearing) type chain
- BP (bar and pin) type chain

★

Finished Steel Roller Chains and Sprockets

- All manufacturer's standard, size ⅜ in. to 2½ in. pitch
- Single and Multiple Strands
- Extended Pitch Series in sizes 1¼ in. to 4 in. pitch

★

Silent Chain and Sprockets

- All sizes ⅜ in. to 1½ in. pitch

★

Flexible Couplings

- Roller chain type
- Silent chain type

Sprocket chain is essentially an assembly of Sidebars, Bushings, Rollers and Pins, fabricated from Strips, Bars, and Rounds of steel.

Since UNION manufactures all types of steel sprocket chain for the transmission of power and the mechanical handling of materials and **nothing else,** the specifications of every lot of Steel which UNION buys, are determined only by the desire to build the greatest ultimate service into the particular chain part for which it is required. This circumstance should be interesting to UNION'S present and future customers.

The Union Chain and Manufacturing Company TRANSMIT POWER UNION CHAINS CONVEY MATERIALS **Sandusky, Ohio, U.S.A.**

Geneva Expansion Gains

U. S. Steel subsidiary has finished third of project, with completion slated for early 1949

GENEVA Steel Co. has finished about a third of its plate mill conversion project and completion of the expansion is expected early in 1949.

The mill, near Provo, Utah, is being equipped for manufacture of coils of hot strip steel for eventual processing into cold-rolled sheets and tin plate at Columbia Steel Co.'s mills at Pittsburg and Torrance, Calif. Both Geneva and Columbia are U. S. Steel Corp. subsidiaries.

Equipment being installed for Geneva includes two additional roll stands in the 132-in. plate mill and two coilers. There are now four stands in the continuous finishing group of the plate mill capable of rolling plates from 1½-inch to 3/16-inch thick, and with the addition of the new stands the mill will be able to roll strip down to 1/20-inch thick.

The framework of a two-bay building for handling and shipping hot-rolled coils is being erected at Geneva by American Bridge Co., another U. S. Steel Corp. subsidiary. Each bay of the building is 425 ft long by 70 ft wide.

Belmont Opens Chicago Plant

BELMONT Steel Corp. has opened its new offices and warehouse at 9400 W. Belmont Ave., Franklin Park, suburb of Chicago. The new plant, under construction for the past year, is designed for warehousing and processing sheet and strip steel.

Equipment now in operation includes complete lines for slitting, shearing, edge rolling, leveling, deburring, flattening, straightening and decoiling. Handling machinery is designed for coils up to 6 tons. Other processing devices in the plant will slit, shear, level and edge roll coils and flat sheets up to ¼-in. thickness.

Gilbert Sees Earnings Improve

A. C. GILBERT CO., New Haven, Conn., manufacturer of home appliances, construction toys and scale model electric trains, anticipates improved earnings for 1948.

Although 1947 gross sales were at a record $10,728,000, the company this year expects its volume to exceed $13 million. Production of trains and accessories has been stepped up to six times that of 1941. Major cloud on the production horizon is materials shortages. The company, large user of steel, is shifting to plastics and substitute metals wherever possible.

Air Force To Buy 5000 Engines

AIR FORCE will buy more than 5000 aircraft engines in the current fiscal year at a cost of $367 million. Some of the orders have been placed. Others are being negotiated.

Four manufacturers will supply the engines: Pratt & Whitney Division of United Aircraft Corp., Allison Division of General Motors, General Electric Co. and Wright Aeronautical Corp., division of Curtiss-Wright Corp. Wright plans to begin large scale production of the Cyclone 7 or R-1300 aircraft engines and resume the quantity production of Cyclone 9 or R-1820 engines. The Air Force has ordered 348 of the former and 128 of the latter.

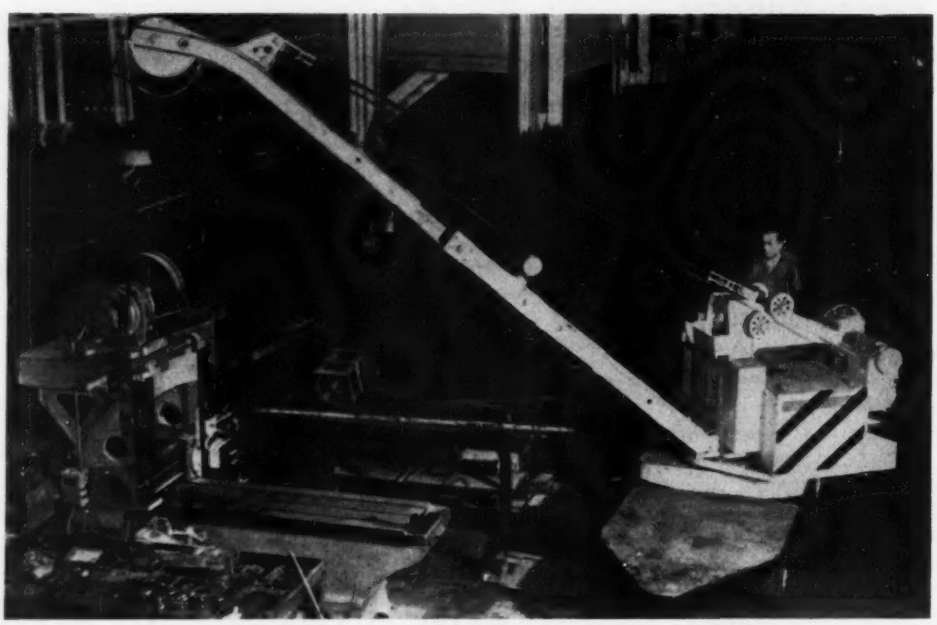
Meanwhile, aircraft makers on the Pacific Coast, with contracts for 2309 planes for the Air Force and Navy, report shortages of manpower and materials. The factories need aircraft engineers, tool makers, machinists and electricians. They also report shortages in alloy steel fuel pumps, hydraulic valves and landing gear struts.

Thompson Outlook Promising

GOVERNMENT rearmament program, sustained demand for original automotive equipment and increasing need for automotive replacement parts has made the outlook bright for Thompson Products Inc., Cleveland.

A supplier of jet engine parts, the firm is in the process of retooling its aircraft production facilities, with higher output scheduled for early 1949. Promising production items in its line of original auto equipment are the vitameter and a new oil control piston ring. The former, now in limited output, is a device designed to step up engine performance by an alcohol-water injection into the fuel system.

Surge in the company's automotive replacement business has pushed Thompson first half sales in excess of $49 million, compared with sales of $47,100,000 for the same period last year.



LIFTING IT HIGH: One of several types of storage battery powered industrial trucks in the plant of Foote-Burt Co., Cleveland, is this crane and platform truck, shown placing a heavy motor atop a piece of machinery at a height of 12 feet. Unit has a capacity of 3000 pounds. Courtesy, Electric Industrial Truck Association

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Department of the Interior will start work immediately on the design of the $750,000 lignite research laboratory to be built by Bureau of Mines at Grand Forks, N. D. Construction is expected to get under way this fall.

—o—

Automatic Transportation Co., Chicago, has received an order from Oldsmobile Division, General Motors Corp., for an electric industrial truck to be used in handling dies. Unit has capacity of 80,000 pounds.

—o—

Alabama coal production during the first six months of 1948 fell behind that for the same period last year. Figures for the two periods, respectively, are: 8,989,199 and 9,347,000 tons.

—o—

American Tool Works Co., Cincinnati, manufacturer of lathes and drills, has purchased a factory adjacent its plant from War Assets Administration for $429,000. Firm had leased the government-built facility.

—o—

Southern Line Material Co., Birmingham, manufacturer of electric products, has purchased and plans to expand a plant on Vanderbilt Rd., Birmingham. Firm will move there and has sold its facilities at 3103 27th Ave. N., to Lamson & Sessions Co., Cleveland, manufacturer of fasteners. Lamson & Sessions already operates a branch plant adjacent the newly acquired property and will use it for expansion.

—o—

Mead Specialties Co., Chicago, manufacturer of air cylinders, work feeders and other air-operated devices, has appointed R. M. Wright Co., Detroit, its agent for most of Michigan, and Jackson-Walter Co., Philadelphia, as its representative for eastern Pennsylvania, southern New Jersey, Delaware and Maryland.

—o—

Howard Air Conditioning Ltd., Montreal, Que., producer of oil burners, stokers and cooling and ventilating devices, has changed its name to Webster Industries Inc.

—o—

Southern Research Institute, Birmingham, reports its research volume during the first half of this year exceeded $480,000, compared with $320,599 for 1947.

—o—

War Assets Administration is offering for sale or lease the Nicaro Nickel Plant in Cuba, built during the war by Reconstruction Finance Corp. for approximately $32 million. The plant, with a capacity of 32 million pounds of nickel per year, was constructed for Nicaro Nickel Co., owned jointly by Freeport Sulphur Co. and the U. S. government.

—o—

Gray Iron Founders' Society Inc., Cleveland, reports that gray iron foundry executives in Chattanooga and Knoxville have formed a Tennessee group. Ormond C. Corry, president, Harrison Corry, Knoxville, is chairman of the new group.

—o—

Rheem Mfg. Co., San Francisco, is marketing two new console heaters, one for oil and one for gas, designed to heat a small house or to provide auxiliary heating in larger homes.

—o—

General Instrument Corp., Elizabeth, N. J., has purchased a radio equipment plant in Newark, N. J., from War Assets Administration for $335,000. Facility will be used for the manufacture of vari-type machines.

—o—

Stearns Magnetic Mfg. Co., manufacturer of magnetic separators, pulleys, drums, lifting magnets, clutches and brakes, is now occupying an addition to its Milwaukee plant. New building will house the administrative and engineering divisions and a laboratory for research and material testing.

—o—

Northup Aircraft Inc., Hawthorne, Calif., is negotiating to subcontract production of new B-49 bombers to Consolidated Vultee Aircraft Corp. Air Force recently ordered 30 of the 100-ton jet-propelled planes.

—o—

Firestone Tire & Rubber Co., Akron, has started production of tires in its new plant at Papanui, New Zealand. The factory will supply New Zealand, as well as the entire southwest Pacific area market.

—o—

Economic Cooperation Administration has authorized procurements of $835,022,702, with adjustments, as of July 25. The total figure includes procurement authorizations for western European countries, Trieste and China.

—o—

Fisher Body Division, General Motors Corp., reports production of station wagon bodies for Chevrolet and Oldsmobile has started at its new Euclid, O., plant. Production in the initial stages has been about five bodies per hour, but will climb until an average of 4500 monthly is reached some time in 1949.

—o—

War Assets Administration is inviting bids for purchase or lease of the West Yard, Moore Drydock, Oakland, Calif. Facility is adaptable to ship repairing, scrapping or other marine uses.

—o—

Rust Furnace Co., Pittsburgh, has received a contract from Pittsburgh Piping & Equipment Co., Pittsburgh, for design and construction of a car-type furnace for heat treatment of complex pipe assemblies.

—o—

Pettibone Mulliken Corp., Chicago, producer of forgings and castings, has purchased Universal Engineering Corp., Cedar Rapids, Iowa, manufacturer of crushers, pulverizers and conveyors.

—o—

Wendt-Sonis Co., Hannibal, Mo., manufacturer of carbide cutting tools, has opened warehouses at 1361 W. Lake St., Chicago, and 909 Main St., New Rochelle, N. Y. J. J. Gardenhire is manager at Chicago and Walter Ruppel and Tony Allen are in charge of the New Rochelle operation which was organized in cooperation with Eastern Carbide Corp.

—o—

Bethlehem Steel Co., Bethlehem, Pa., is nearing completion of a $300 million postwar expansion program. One of the final phases is a housekeeping project involving landscaping, interior painting and rearrangement of production facilities to provide more space.

—o—

Lovejoy Tool Co. Inc., manufacturer of milling cutters, has moved into a new plant adjacent to its former facilities in Springfield, Vt.

—o—

Perlite Mfg. Co., recently formed at Carnegie, Pa., has begun production of perlite, a lightweight building aggregate.

—o—

L. J. Wing Mfg. Co., New York, manufacturer of heating, ventilating and combustion products, has appointed J. C. Davis Ltd., Winnipeg, Man., as an agent for Manitoba, Saskatchewan and Alberta, and Control Equipment Co., Toronto, Ont., as a representative in Ontario.

—o—

General Electric Co., Schenectady, N. Y., announces it is building the electric drive equipment for pumps which will increase the available water supply of Cincinnati by 150 million gallons daily.

The Business Trend

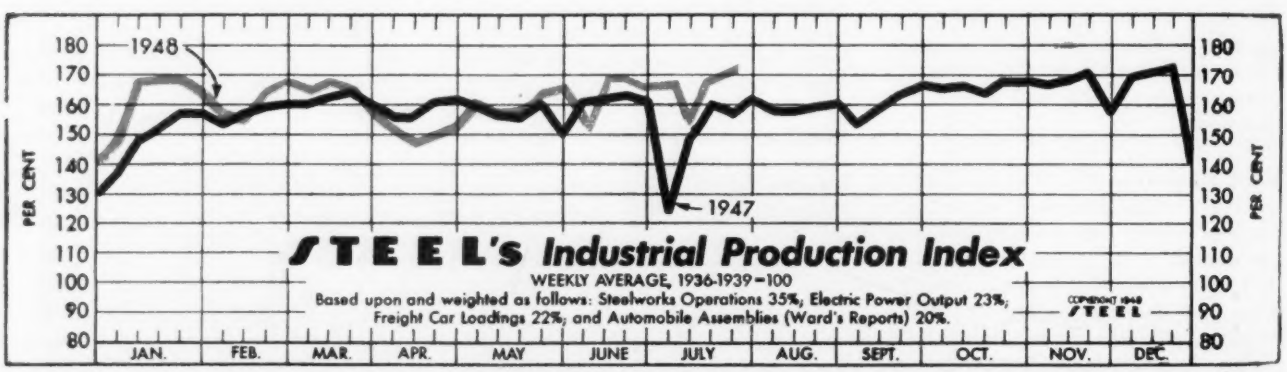
NEW 1948 PEAK level of industrial activity was reached in the week ended July 24 when moderate improvements in several important basic indicators pushed STEEL's index to 172 per cent (preliminary) of the 1936-1939 weekly average.

PRODUCTION—June's overall level of industrial production, measured by the Federal Reserve Board, was slightly higher than in May, FRB's index rising to 192 per cent of the 1935-1939 average from 191 in the previous month. The higher output rate also continued into the first half of July. Gain in durable goods turnout largely reflected higher automobile production rates, as steel output continued at the May level and nonferrous metals production slipped, with activity curtailed in flood-endangered aluminum plants.

MANUFACTURERS' SALES—One less working day in May than in April was attributed by the Bureau of Foreign & Domestic Commerce as the reason for a $700-million drop in manufacturers' billings. On a daily average basis, these sales were unchanged. This stability contrasts with a 2 per cent dip in the May, 1947, rate of sales from April, 1947. Durable goods sales aggregated $6.5 billion, with higher daily sales noted in the basic metals producing industries and in the machinery (other than electrical) groups. Lower sales rate was evident in the automotive industry and in the transportation equipment and electrical machinery industries. Nondurable sales totaled $10 billion. Volume of new orders placed in May was 4 per cent lower than in April; however, in relation to May sales unfilled orders were fractionally above the April ratio. Book value of manufacturers' inventories rose $300 million to $29.4 billion.

PRICES—Inflation's yardstick, the Bureau of Labor Statistics Consumers' Price Index, twisted upward to an all-time high between May 15 and June 15, the overall advance of 0.7 per cent in retail prices of goods and services bought by moderate-income families in large cities pushing the index to 171.7 per cent of the 1935-1939 average. This level is 9.3 per cent higher than a year ago, 28.8 per cent above June, 1946, and 74.1 per cent over the August, 1939, figure. A record rise of 1.5 per cent in food prices led the increase. Wholesale prices in the week ended July 17 were at a postwar peak of 168.9 per cent of the 1926 average. Blame is centered on the simple economic fact that consumers want, and are able to pay for, more goods than are available. Personal income for the first five months of 1948, Department of Commerce states, was at an annual rate of $207.6 billion, compared with $189.7 billion for the like 1947 period.

CORPORATE PROFITS—Net income after taxes of all domestic manufacturing corporations aggregated $10.1 billion in 1947, Federal Trade Commission and the Securities & Exchange Commission report. These companies' sales were $150.7 billion. Fourth quarter net income was $2.6 billion, $130 million more than in third quarter and $60 million more than in second quarter, but about $100 million under first quarter.



Index (chart above): Week ended July 24 (preliminary) 172 Previous Week 168 Month Ago 165 Year Ago 157

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	93.0	90.5	96.0	95.0
Electric Power Distributed (million kilowatt hours)	5,342	5,197	5,257	4,730
Bituminous Coal Production (daily av.—1000 tons)	2,036	1,679	2,235	2,026
Petroleum Production (daily av.—1000 bbl.)	5,448	5,444	5,494	5,084
Construction Volume (ENR—Unit $1,000,000)	$143.2	$126.6	$160.2	$134.8
Automobile and truck output (Ward's—number units)	117,622	120,741	95,027	83,867

* Dates on request. † 1948 weekly capacity is 1,802,476 net tons. 1947 weekly capacity was 1,749,928 net tons.

TRADE				
Freight Carloadings (unit—1000 cars)	910†	893	889	920
Business Failures (Dun & Bradstreet, number)	91	91	111	76
Money in Circulation (in millions of dollars)‡	$27,864	$27,959	$27,792	$28,145
Department Store Sales (changes from like wk. a yr. ago)‡	+9%	−4%	+21%	+8%

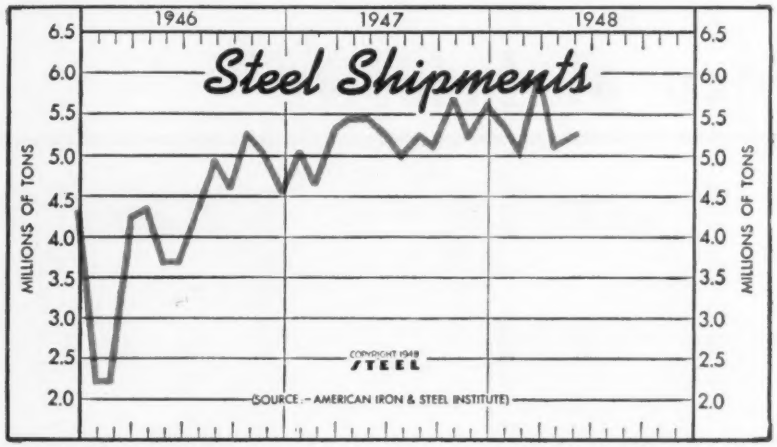
† Preliminary. ‡ Federal Reserve Board.

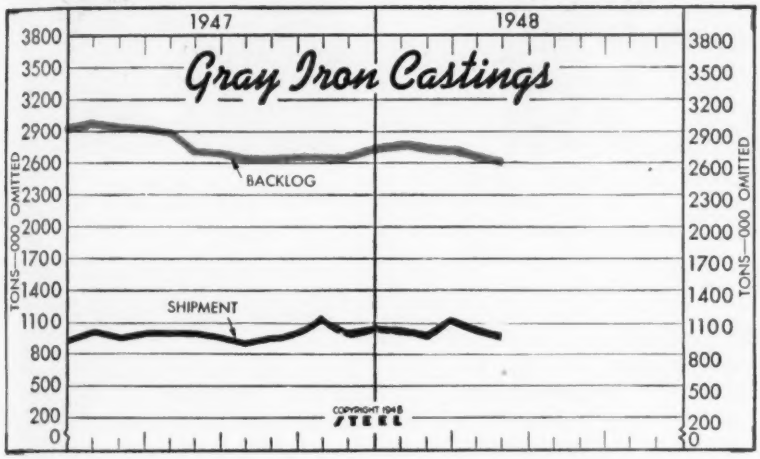
Steel Shipments

(Net Tons)

	1948	1947	1946
Jan.	5,410,438	5,061,333	2,189,369*
Feb.	5,046,115	4,626,424	2,189,368*
Mar.	5,978,551	5,304,415	4,213,913
Apr.	5,096,161	5,445,993	4,335,694
May	5,321,375	5,442,343	3,666,677
June	.....	5,263,711	3,687,509
July	.....	4,974,566	4,259,494
Aug.	.....	5,278,223	4,965,456
Sept.	.....	5,118,839	4,589,902
Oct.	.....	5,681,597	5,260,832
Nov.	.....	5,216,990	5,019,984
Dec.	.....	5,613,036	4,533,420

* Figures for January and February, 1946, are merely averages derived from a report that combined shipments for those two strike-affected months into a total of 4,378,737.





Gray Iron Castings

(U. S. Bureau of Census)

Tons—000 omitted

	Shipments		Backlogs*	
	1948	1947	1948	1947
Jan.	1,064	1,078	2,803	3,021
Feb.	1,024	1,010	2,769	2,987
Mar.	1,169	1,090	2,726	2,979
Apr.	1,051	1,097	2,691	2,908
May	993	1,097	2,602	2,783
June	....	1,038	....	2,711
July	....	913	....	2,657
Aug.	....	952	....	2,631
Sept.	....	1,025	....	2,680
Oct.	....	1,154	....	2,669
Nov.	....	1,020	....	2,687
Dec.	....	1,066	....	2,782
Total		12,541		

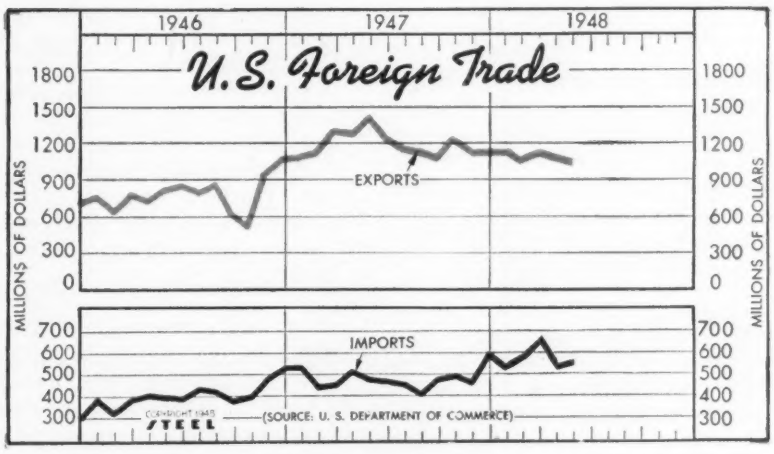
* Unfilled orders for sale to the trade.

Foreign Trade

Bureau of Foreign and Domestic Commerce

(Unit Value—$1,000,000)

	Exports			Imports		
	1948	1947	1946	1948	1947	1946
Jan.	1,091	1,114	798	546	531	394
Feb.	1,086	1,146	670	582	437	318
Mar.	1,141	1,327	815	666	444	381
Apr.	1,123	1,299	757	527	512	406
May	1,103	1,503	851	549	474	393
June	....	1,320	878	...	463	382
July	....	1,162	826	...	450	431
Aug.	....	1,151	883	...	400	422
Sept.	....	1,109	643	...	481	377
Oct.	....	1,235	536	...	492	394
Nov.	....	1,138	986	...	455	478
Dec.	....	1,112	1,097	...	601	529



FINANCE	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$14,249	$14,083	$15,135	$12,636
Federal Gross Debt (billions)	$253.4	$252.9	$251.7	$258.8
Bond Volume, NYSE (millions)	$20.0	$19.1	$24.1	$22.2
Stocks Sales, NYSE (thousands)	6,906	7,211	7,631	5,423
Loans and Investments (billions)†	$62.9	$62.6	$63.1	$63.4
United States Gov't. Obligations Held (millions)†	$34,656	$34,431	$35,250	$39,145

† Member banks, Federal Reserve System.

PRICES				
STEEL's composite finished steel price average	$88.36	$80.27	$80.27	$69.14
All Commodities†	168.9	166.8	165.3	150.3
Industrial Raw Materials†	186.4	184.2	182.7	165.2
Manufactured Products†	163.4	161.1	159.5	145.1

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry

DON G. SAVAGE

Don G. Savage, general sales manager, Thew Shovel Co., Lorain, O., power shovel and crane manufacturing firm, has been elected vice president, and will continue in charge of sales. Mr. Savage, who started his career with the company as a clerk 28 years ago, was southeastern sales manager, with headquarters in Atlanta, prior to his appointment in 1935 as general sales manager.

—o—

Thomas F. Marlow has been named vice president in charge of operations at Standard Tube Co., Detroit. Mr. Marlow joined Standard in 1944 as works manager. Prior to that time he had been superintendent of the Detroit plant of Republic Steel Corp.'s Steel & Tubes Division.

—o—

Robert Fischer has been named superintendent, Falk Welding Division, Falk Corp., Milwaukee. Associated with the firm since 1936, Mr. Fischer was formerly supervisor of standards. He will be assisted by **Elmer Klumpp,** new general foreman of the weld shop. Succeeding Mr. Fischer as supervisor of standards is **John Linehan,** who continues as wage supervisor and head of the two newly consolidated departments. **Walter Maloy** has been appointed general foreman of the night foundry under the direction of **Fred A. Pritzlaff,** foundry superintendent.

—o—

Appointment of **Frederick M. Bock** as assistant to the president, Pioneer Engineering & Mfg. Co., Detroit, has been announced by the company. He joins Pioneer after association with Burroughs Adding Machine Co., where he was assistant to the works manager. He previously worked four years as assistant works manager of the Weatherhead Co., Cleveland.

ARTHUR W. McKINNEY

—o—

Arthur W. McKinney, vice president and general manager of sales, National Supply Co., Pittsburgh, has been elected to the newly created position of executive vice president of the company. Mr. McKinney joined National Supply Co. as a salesman in 1920, and rose through various sales positions to become vice president and general manager of sales in 1940. A few weeks ago Mr. McKinney was elected president of Petroleum Equipment Suppliers Association. He is a director of National Supply Co. and Oil Well Engineering Co. Ltd., Cheadle Heath, England.

—o—

B. T. Hain, manager of the Bond plant of the American Radiator & Standard Sanitary Corp., Buffalo, has resigned to become vice president and general manager in charge of manufacturing for National Radiator Co. at Johnstown, Pa. Mr. Hain had been connected with American Radiator company 21 years and manager of the Bond plant, which produces cast iron furnaces for homes, for 17 years.

—o—

Whitley B. Moore has been elected vice president in charge of sales, Timken Roller Bearing Co., Canton, O., succeeding **L. M. Klinedinst,** who has retired after 43 years with the company. Associated with the company for a number of years, Mr. Moore had charge of its Steel Sales Division during World War II, and about three years ago was appointed director of all sales. Mr. Klinedinst, who had been vice president since 1930, and a director since 1934, will remain a director of the company, and further serve as sales consultant. He retired under the company's anunity plan in effect for the past several years.

KENNETH F. WHITFIELD

—o—

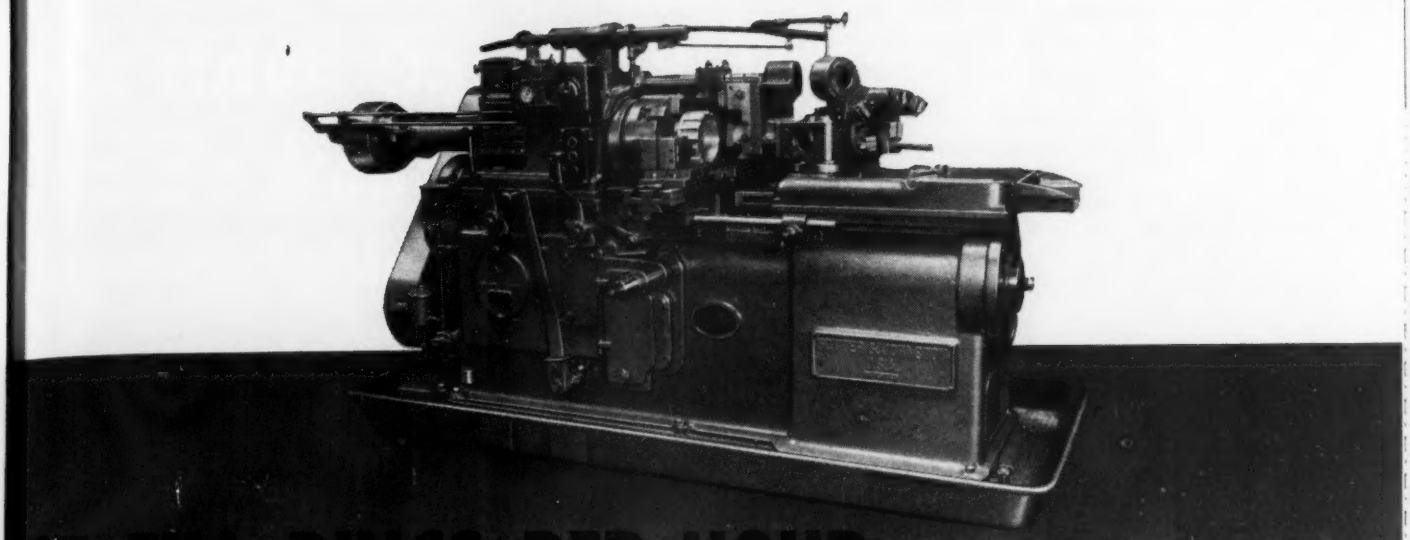
Kenneth F. Whitfield, formerly assistant general sales manager, has been appointed advertising and sales promotion manager of Walker-Turner, division of Kearney & Trecker Corp., Plainfield, N. J. Mr. Whitfield is a graduate of Newark College of Engineering, and has worked in an executive capacity with Walker-Turner for 15 years.

—o—

Rolland I. Peters has been appointed technical director of Ditzler Color Division, Pittsburgh Plate Glass Co., Pittsburgh. Associated with the division since 1936, Mr. Peters succeeds **M. G. Bell,** who will enter business for himself as a Ditzler jobber at Seattle. Mr. Peters has been serving as assistant technical director under Mr. Bell. **Harold W. Redshaw** has been appointed to the latter position. He has been with the Ditzler laboratories since his graduation in 1935 from Detroit Institute of Technology.

—o—

Industrial Corrosion Control Inc., Pittsburgh, whose chief service is lining industrial equipment with anti-corrosive coatings, has been recently incorporated under the direction of **R. G. Forsberg,** president. Mr. Forsberg also serves as president of Penn-Ohio Industrial Sales Co., supplier of industrial equipment and Pittsburgh representative for Industrial Corrosion Control Inc. He was formerly associated with Jessop Steel Co. as purchasing agent, and Timken

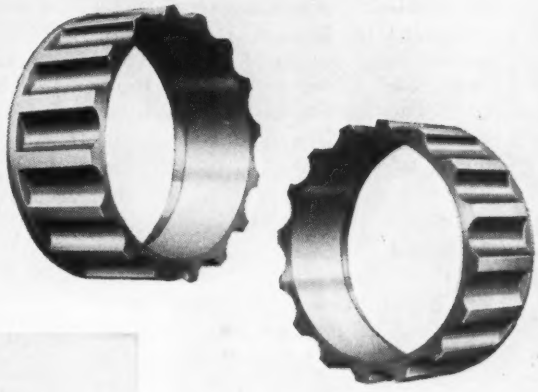


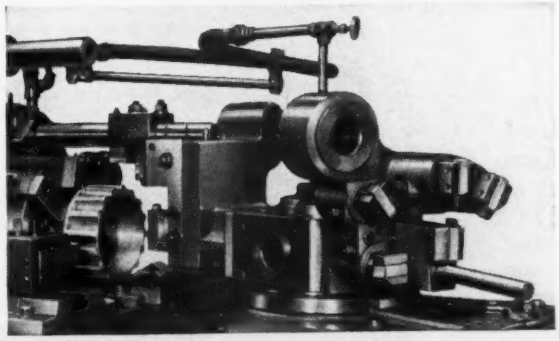
17 FILL RINGS PER HOUR

perfectly machined on this P. & J. 4-D Automatic Turret Lathe

The cast aluminum fill ring pictured here required tooling up for only two of P. & J. 4D automatic turret lathe's five turret faces. Only two faces in use to rough bore, rough turn, straddle-face, chamfer, finish bore and finish turn! This means that there is ample provision left for other tooling in the event that, at a future time, other objects are to be machined. Tooled as shown, each fill ring is handled in an average time of 2.99 minutes. Moreover, one operator can readily handle several machines, and you don't have to be a production engineer to see how these P. & J. units can produce *more* for *less*, considering our claims and facts. Versatility of tooling is an inherent characteristic of all P. & J. automatic turret lathes, and accounts for the outstanding production records being made by these machines every day on a wide range of work. Send us duplicate parts—or blueprints—and we will show you how to improve the quality of production, and at the same time cut cost per piece.

DETAILS OF THE JOB	
PART	CAST ALUMINUM FILL RING
METHOD AND OPERATION	Presenting chucking ring to spindle; grip under same with 3 chuck jaws. Machine as follows:
1st T.F	Rough bore hole; rough turn O.D.; straddle-face ends; chamfer where necessary.
2nd T.F	Blank.
3rd T.F.	Finish bore 6.285" dia. hole; finish turn O.D. (vertical slide tool).
4th T.F	Blank.
5th T.F.	Blank.





POTTER & JOHNSTON CO.
PAWTUCKET, RHODE ISLAND
Subsidiary of
PRATT & WHITNEY
Division Niles-Bement-Pond Company

Roller Bearing Co. General sales offices for Industrial Corrosion Control Inc. will be maintained at the Empire Bldg., Pittsburgh, with **James D. Clokey Jr.** as sales manager. Mr. Clokey was formerly general manager of sales, Washington Steel Corp., Washington, Pa., stainless steel specialist for Superior Steel Corp., Carnegie, Pa., and was also associated with Carnegie-Illinois Steel Corp.

—o—

Paul Queneau has been appointed metallurgical engineer, International Nickel Co. of Canada Ltd., and subsidiaries. He has been superintendent of research at International Nickel's mines and plants at Copper Cliff, Ont., since May, 1941. In his new position his headquarters will be at New York. Mr. Queneau joined the company in 1934. He is succeeded as superintendent of research at Copper Cliff by **W. K. Sproule,** formerly chief physicist of the company's Copper Cliff research laboratory.

—o—

Arthur J. Gentholts, vice president, Truscon Steel Co. and assistant counsel of Republic Steel Corp., Cleveland, has been elected president, Ohio Manufacturers' Association, succeeding **James C. Argetsinger,** vice president and general counsel, Youngstown Sheet & Tube Co., who held the post for eight years.

—o—

Lloyd Arnold, salary administration supervisor, American Steel & Wire Co., Cleveland, has retired after nearly 48 years of service with this U. S. Steel Corp. subsidiary. He is succeeded by **Edward C. Barnhart,** senior salary analyst of the company, who joined U. S. Steel Corp. in 1944 as an industrial engineer for National Tube Co., and later transferred to U. S. Steel Corp. of Delaware as a salary analyst. He was transferred to the wire company a year ago.

—o—

George J. Fischer has been named manager of national accounts, Industrial Products Sales Division, B. F. Goodrich Co., Akron. He has been product manager in the division for the last several years, handling the sales of hose. **James M. Flounders** succeeds Mr. Fischer as product manager.

—o—

Additions to its sales and service staffs have been announced by Brown Instrument Co., subsidiary, Minneapolis-Honeywell Regulator Co., and the cities to which each of these newly appointed engineers are assigned are as follows: **G. L. Ferguson,** sales engineer, Atlanta; **Wayne Cook** and **Carl Lower,** service engineers, Baltimore; **Warren N. Smith** and **Albert E. Phillips,** service engineers, Boston; **W. Williamson Jr.,** service engineer, and **R. J. Holt,** sales engineer, Charlotte; **Bernard Fuller** and **Ormond Herring,** sales engineers, Chicago; **R. Schumaker,** sales engineer, Cleveland; **Robert Koening,** service engineer, Denver; **W. DeWolf,** service engineer, Detroit; **Robert Harris Jr.,** sales engineer, Dallas; **C. D. Walker,** sales engineer, Houston; **Barry Coleman** and **Robert Thomas,** service engineers, Indianapolis; **Richard Corbin,** service, and **Ralph Imbrogno,** sales, Los Angeles; **A. Godfrey,** sales, and **Ernest P. Lang, William C. Meyer** and **Edward J. Roach,** service, New York; **A. L. Rogers Jr.,** sales, and **Albert T. Collins, Joseph Facer** and **Edward A. Lytle,** service, Philadelphia; **Keith H. Webb,** service, St. Louis; **Richard Caviniss** and **George Wilson,** service, Syracuse; **John R. Shea,** service, Washington; **D. W. Rees,** service, Kansas City; **H. C. Klug,** sales, Omaha; and **William Harris,** sales, East Orange, N. J.

—o—

Richard D. Gleason has been appointed manager of employee and community relations by General Electric X-Ray Corp. at Milwaukee, a subsidiary of General Electric Corp. Mr. Gleason succeeds **F. E. Scheven,** who, because of illness, has requested to be relieved of these duties. Mr. Scheven had been appointed to the staff of the executive vice president. Mr. Gleason goes to G. E. X-Ray from Locke Inc., Baltimore, also a G-E affiliate, where he was vice president in charge of employee and community relations.

—o—

William B. Sullivan has retired as manager of alloy sales, Lebanon Steel Foundry, Lebanon, Pa., after 45 years' service as a steel executive and pioneer in the development of high temperature alloy castings. He joined the Lebanon staff in 1935, and previously had been connected with Rich Tool Co., Chicago; Michiana Products Corp., which he organized in 1928; and Carpenter Steel Co.

RICHARD D. GLEASON

—o—

William W. St. Cyr has been appointed a sales representative in Louisiana and Mississippi for Rapids-Standard Co. Inc., Grand Rapids, Mich. He will have offices in New Orleans. Until recently Mr. St. Cyr was head of St. Cyr Food Products Co.

—o—

George Miller has been appointed general sales manager, Newgren Co., Toledo, O., which firm engineers, develops and sells specialized farm equipment for use as attachments to the Willys-Overland jeep. For the last year Mr. Miller has been in charge of tractor and truck seat sales for Monroe Auto Equipment Co., Monroe, Mich. For 25 years he was associated in a sales executive capacity with the Chrysler Division, Chrysler Corp., and later served as sales manager, Super Six Mfg. Co., Minneapolis, farm implement manufacturer.

—o—

New officers elected by Milwaukee Association of Purchasing Agents are: **C. H. Dawley,** Ampco Metal Inc., president; **F. C. Syburg,** Chain Belt Co., national director; **N. A. Schowalter,** West Bend Aluminum Co., secretary; and **W. H. Pritchard,** Kearney & Trecker Corp., vice president.

—o—

Iron & Steel Products Inc., Hegewisch Station, Chicago, dealer in new and used railroad equipment, merchant iron and steel products, machinery and equipment, announces appointment of **J. J. Collins** as assistant general manager. Mr. Collins has been employed by the Erie Railroad for the past 37 years in various supervisory positions in the purchases and stores, mechanical, and scrap and reclamation departments.

—o—

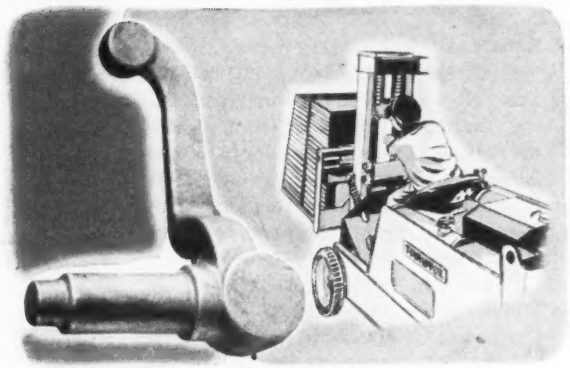
Ronald E. Kucher, president, Olympic Foundry Co., Seattle, has been elected chairman of the board of Washington Employers Inc., succeeding **Ferdinand Schmitz Jr. Phil Bannan,** area manager, Western Gear Works, has been named vice president to succeed Mr. Kucher. **Darrah Corbet,** president, Smith Cannery Machines Co., was re-elected secretary-treasurer. Trustees include **John Holstrom,** Kenworth Motor Truck Corp., and

When You Use a FORGING, You Have Done All That Can Be Done to Forestall Unpredictable Parts Failures

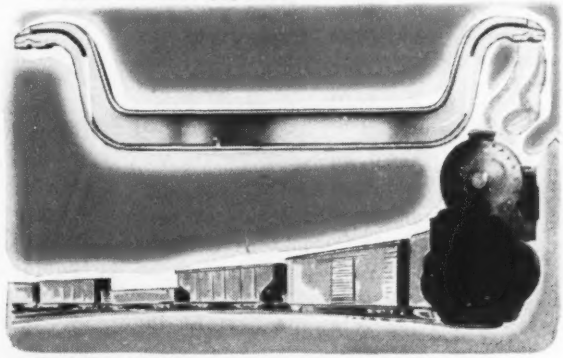
Macro-etch through longitudinal cross-section of pinion rack used on power shovel shows fiber-like structure in rack teeth which provides maximum resistance to wear, and strength and toughness for shocks and stresses occurring continually when in use. This fiber-like structure is common in all high quality forgings.

THERE IS NO SUBSTITUTE for the strength and toughness inherent in the forged fiber-like flow-line structure of forgings. The forging method of fabricating parts in closed impression dies directs, controls and concentrates the fiber-like flow-line structure of metals at points of greatest shock and stress. In forgings you obtain the strength and toughness for unrelenting and uninterrupted performance. When you use a forging, you have done all that can be done to forestall the failure of parts and to protect the user of your equipment from unpredictable emergencies. Forgings provide rapid assembly of complex parts as by welding; forgings permit reduction of dead weight because maximum strength and toughness are obtainable in lighter sectional thicknesses. The metal quality and cost-reducing advantages obtainable in forgings cannot be equalled or duplicated. Recheck every stressed part in your equipment, and consult a forging engineer about possibilities for reducing costs of machining and finishing, speeding up assembly and improving performance. Only a forging engineer can inform you fully regarding the many advantages of forgings.

DROP FORGING ASSOCIATION
605 HANNA BUILDING • CLEVELAND 15, OHIO



The steering mechanism of Towmotor lift trucks must operate smoothly at all times and under all kinds of loading without failure. To insure such trouble-free performance, the engineer designed this steering knuckle to be a forging, thereby obtaining a greater factor of safety which is so essential in materials handling equipment.



Drop Forged I-Beam Equalizer weighing 405 lbs. replaces an 800 lb. unit on freight cars. This illustrates how forgings reduce dead weight, yet provide a greater factor of safety that is so important in railroad operation. This drop forged I-Beam requires less machining and processing, and scrap loss is almost totally reduced because forgings are unusually free of concealed defects.

DROP FORGING ASSOCIATION

DROP FORGING ASSOCIATION
605 HANNA BUILDING • CLEVELAND 15, OHIO

☐ Booklet on "Metal Quality — Hot Working Improves Properties of Metal."

☐ "Drop Forging Topics" which presents numerous end use applications of forgings.

Name ..... Position .....

Company .....

Address ..... City ..... State .....

PAUL H. STARTZMAN

General manager in charge of operations, Oliver Iron & Steel Corp., Pittsburgh. Noted in STEEL, July 26 issue, p. 63

PETER ROBERTSON

Named assistant to Cleveland district manager, Republic Steel Corp. Noted in STEEL, July 12 issue, p. 84

ROBERT D. WILLIAMS

Appointed personnel manager, Tinnerman Products Inc., Cleveland. Noted in STEEL, July 26 issue, p. 58

W. R. Yeakel, Northwest Bolt & Nut Co.

—o—

Robert A. Hipke, sales manager, Sivyer Steel Casting Co., Milwaukee, was elected president, Alloy Casting Institute. Other officers elected are: **H. A. Cooper,** president, Cooper Alloy Foundry Co., vice president; **E. A. Schoefer,** Alloy Casting Institute, executive secretary and treasurer; **R. W. deWeese,** Electric Steel Foundry Co., and **H. Klouman,** vice president, Michiana Products Corp., elected to the board of directors for three year terms. In addition **H. S. Avery,** research metallurgist, American Brake Shoe Co., and **L. S. Johnson,** foundry superintendent, Midvale Co., were elected chairmen of the technical research committee and the shop practice committee, respectively.

—o—

Frank G. Weyforth, president, Inter-State Sales, has been appointed Hiram Swank's Sons, Johnstown, Pa., representative at St. Louis.

—o—

Bowen Products Corp., Ecorse, Mich., manufacturer of lubricating devices, announces the appointment of **John H. Roehm** as sales manager of the division manufacturing lubricating devices for the automotive, aviation, and other industries. Before entering the armed forces, Mr. Roehm was associated with the Detroit division of General Electric Supply Corp. Following his discharge from the Army, he resumed his work with General Electric, remaining with the firm until recently, when he accepted his present position.

—o—

M. R. Hanna, engineer, Motor Engineering Division, Erie Works of General Electric Co., Schenectady, N. Y., which position he has held since 1926, has retired after 45 years' service with the company.

—o—

Edward A. Halbleib has retired as general manager of Delco Appliance Division, General Motors Corp., at Rochester, N. Y., after nearly 40 years of association with the division and its predecessors in Rochester. He will be succeeded by **Paul H. Rutherford,** who has been associated with General Motors appliance production since 1926. Mr. Rutherford has served as assistant general manager of Delco Appliance at Rochester since June, 1947.

—o—

R. Lavin & Sons Inc., Chicago, announces that **W. M. Ball Jr.** has become associated with its technical staff as metallurgist and foundry consultant. For the past 27 years Mr. Ball has been superintendent of the foundry of Magnus Brass Division of the National Lead Co., Cincinnati, formerly the Edna Brass Mfg. Co. He has been a member of the American Foundrymen's Society, American Society for Metals, Engineering Society of Cincinnati, and the Foremen's Club of America.

—o—

National Sprayer & Duster Association elected the following officers for the new year: **R. C. Hudson,** president, H. D. Hudson Mfg. Co., Chicago, was re-elected president and chairman of the executive board; **Harold F. Brandt,** president, Dobbins Mfg. Co., Elkhart, Ind., re-elected vice president and board vice chairman; **D. P. Lewis,** H. D. Hudson Mfg. Co., will continue as treasurer; and **Frank J. Zink** and **Earl D. Anderson,** Frank J. Zink Associates, Chicago, were retained as counsel and secretary, respectively. Members of the executive board, in addition to the officers named, include **R. B. Chapin,** R. E. Chapin Mfg. Works Inc., Batavia, N. Y.; **V. A. Snell,** Lowell Mfg. Co., Chicago; **C. D. Leiter,** F. E. Myers & Bros. Co., Ashland, O.; **S. H. Samuels,** Standard Container Inc., Montclair, N. J.; and **T. M. Burton,** D. B. Smith & Co. Inc., Utica, N. Y.

—o—

J. E. Hines, sales manager, C. I. Hayes Inc., Providence, R. I., has retired after 26 years' service in that post. He has been closely identified with the electric furnace industry for nearly 40 years, having previously been connected with the Hoskins Mfg. Co., Detroit, for 13 years as sales engineer and district sales manager during the pioneer days of this industry. He will continue in an advisory capacity.

—o—

Orville J. Taylor, Chicago attorney who recently returned from a secret mission in Germany as assistant to the Secretary of the Army, has been elected to the board of directors of John W. Harris Associates, internationally known building organization, New York.

—o—

Dr. William I. Thompson, development engineer, Standard Oil Development Co., for 11 years, and one of the first engineers to be called into the Manhattan District Project, has been named to head the engineering section of the technical group, H. K. Ferguson Co., New York, in the new Atomic Energy Division which is under the direction of **Dr. Karl Cohen.**

—o—

John C. Richards has been appointed general sales manager, Washington Steel Corp., Washington, Pa. He has been with the company as manager of distributors' sales since 1947. Prior to that he was assistant general sales manager, Eastern Stainless Steel Corp. **Robert O. Fulton** has been ap-

RICHARD O. HORNING

Elected assistant treasurer, Mesta Machine Co., Pittsburgh. Noted in STEEL, June 28 issue, p. 66

pointed assistant sales manager. He has been with the firm since 1946 as chief correspondent. **S. M. McGough,** formerly associated with Corey Steel Co., Chicago, has been named sales representative.

—o—

M. T. Victor has been elected president of the newly organized International Powder Metallurgy Co., Ridgway Pa., which produces powdered metal products. Mr. Victor had previously been with the Keystone Carbon Co., where he served as sales and field engineer. Vice president in charge of production for the new company is **G. J. Hoehn,** who for the past 15 years has been supervisor and executive in production of powdered metal parts. **E. C. Berger** is secretary-treasurer of the new firm.

—o—

L. S. Cope has been made head of research and product engineering at Oliver Iron & Steel Corp., Pittsburgh. Formerly general manager in charge of production, Mr. Cope has assumed his new duties on his return from an extended leave of absence. He will assume technical direction of die and tool engineering, metallurgical and special mechanical engineering and product development in his new capacity.

—o—

Jerome B. Magee, former aviation industry executive, has been appointed by Farrar & Trefts Inc., Buffalo, as district sales manager in charge of steel boiler sales in western New York. **Donald F. Baumler** has been placed in charge of fabricated steel and alloy plate work.

—o—

Paul J. Kreischer has been named plant manager of Tonawanda, N. Y., plant, Container Co., a subsidiary of Continental Can Co. Inc. Mr. Kreischer was assistant manager of Container's Van Wert, O., plant. Other appointments for the Tonawanda plant are: **Robert Milander,** superintendent of maintenance; **David Roggenkemper,** in charge of production control and the office; and **James Roberts,** general foreman in charge of operations. Mr. Milander and Mr. Roggenkemper will be transferred from the Reading, Pa., plant, and Mr. Roberts will transfer from Van Wert.

—o—

R. C. Mahon Co., Detroit, announces appointment of **Howard G. Pankratz** as industrial engineer. Before joining the sales-engineering-consultant staff of the Industrial Equipment Division of this company, Mr. Pankratz recently served as consulting engineer on industrial equipment matters.

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W. D. Gilder has joined the staff of Weatherhead Co., Cleveland, in the capacity of project engineer. He was formerly associated with the metallurgical department, National Tube Co., Lorain, O.

—o—

C. F. Cotton has been named western representative for sales and service by Baird Associates Inc., industrial physicists of Cambridge, Mass. He formerly engaged in aeronautical and other engineering works for the U. S. Navy.

OBITUARIES . . .

J. A. Fix, 62, who retired in 1947 as vice president, Continental Motors Corp., Detroit, and who prior to 1942 was vice president and general manager in charge of manufacturing, Oliver Corp., Chicago, was killed in an automobile accident near Jordan, Mont., July 23.

—o—

John E. Lawson, 66, president and a director of the Canadian Niagara Power Co. Ltd., Niagara Falls, Ont., died July 22, in that city.

—o—

Henry S. Binns, 58, head, metallurgical laboratory, Cincinnati Milling Machine Co., Cincinnati, for the past 20 years, died recently. He was an authority on the treatment of metals. Mr. Binns had been chairman of American Society for Metals, and a member of American Foundrymen's Society and the Cincinnati Engineering Society.

—o—

Harry R. Swanson, 48, president and founder, Petro-Chem Development Co. Inc., New York, manufacturer of furnaces, died July 24. He formerly had been an engineer with Procter & Gamble Co., Cincinnati, and Alco Products Inc., subsidiary of American Locomotive Co.

—o—

Philip W. Frieder, 58, prominent in the scrap iron and steel trade in Cleveland, died July 25 of a heart attack. At the time of his death he was vice president, Philip W. Frieder Division, Luria Steel Trading Corp. Mr. Frieder was a past president of the Institute of Scrap Iron & Steel Inc., and a member of the American Iron & Steel Institute.

PHILIP W. FRIEDER

—o—

Robert E. Newcomb, 63, mechanical engineer and inventor, died July 24 at his home in Holyoke, Mass. He began his career with the Deane plant of International Steam Pump Co., now the Worthington Pump & Machinery Corp. He later became works manager. At his death he was president and treasurer, Radio Vision & Advertising Corp., New York. He held patents on foundry equipment and oil burners, and founded the Puritan Oil Co., distributor of industrial and heating oils.

—o—

George W. Dolan, 46, chairman of the board, Mathieson Chemical Corp., New York, died recently.

—o—

Elmer Taylor, 39, assistant sales manager, Louis Allis Co., Milwaukee, died July 21. He had been with the company for 22 years.

—o—

William J. Haines, 79, who retired in 1946 as secretary, Haines Tool Co., Cleveland, died July 25. He had been active in the tool business in Cleveland for almost 30 years.

11 Ton Motor Graders Use FLASH BUTT WELDED RINGS

by AMERICAN WELDING

Structural angles 6" x 4" x 1" weighing 480 pounds are circled and ends joined by flash butt welding into moldboard supports and positioning rings for 11-ton motor graders. This is one of many applications of American Welding's "Controlled Technique" in the manufacture of specialized weldments which include leg in and leg out angles and channels.

Fabrication by welding makes it possible to design for specific jobs at minimum cost . . . strict conformity to specifications and close tolerance provide savings because less machining time is required.

A representative will be glad to call; or send us your specifications and quantities for our prompt recommendations and estimate.

SEND FOR 16 PAGE ILLUSTRATED BOOKLET

THE AW AMERICAN WELDING AND MANUFACTURING COMPANY

110 DIETZ ROAD • WARREN, OHIO

Engineering News . . . AT A GLANCE

SIMPLIFIES EMBLEM PAINTING— In Toledo, O., Conforming Matrix Corp. reports development of a form-fitting, electro-formed metal masking template that makes spray finishing of sunken or raised areas of metal or plastic parts a relatively simple matter. According to the company, bright, durable enamels, one color right after another, can frequently be wet painted before baking, on many convex, concave or irregularly shaped 3-dimensional parts with the masks. They also may be attached to parts moving on a monorail or merry-go-round type handling equipment for either manual or fully automatic spraying.

PICKLING "RETARDERS"— Most common defect encountered in pickling is brass red stain. Presence of this stain is usually caused by lubricating materials being left on the surface of the brass before annealing. Some lubricants, according to Bridgeport Brass Co., Bridgeport, Conn., provide a greater tendency to cause this than others. Less frequently, the presence of metallic iron in contact with the brass during pickling is a cause of red staining, but here the staining takes place close to the point of contact, and is not widespread. In this case it is caused by the copper plating out on the parts because iron is anodic to copper. Great care must be taken to prevent any stray pieces of iron, such as nails or tools from entering the pickling solution.

PACKS "DEEP WALLOP"— Draws 22 inches deep can be made in a single operation by a huge 1000-ton double action press recently built by Hydraulic Press Mfg. Co., Mount Gilead, O., for a prominent foreign auto builder. Reported as one of the largest hydraulic sheet metal drawing presses ever built for export, the unit weighs 350,000 pounds and features pressing surfaces of 144 x 84 inches. It can be fitted with many types and sizes of dies for either single or multi-die operations. The press represents one of the first full-hydraulic designs ever used for automobile body production, where a fast cycle speed is an important factor.

HIGH FREQUENCY HARDENING WELL ESTABLISHED— In Germany, the technique of gear hardening through high-frequency heating seemed to be fairly well established, especially in the lower powers of the order of 20 kilowatt output, according to the Office of Technical Services, Washington. Several of the firms used large apparatus in which whole gears were heated to hardening temperatures electronically. A preliminary design of 200 kilowatt output at 250 kilocycles per second was used experimentally for hardening gears up to 130 mm diameter and 12 mm axial length.

EASES COMPOUND IDENTIFICATION— An indexed compilation of x-ray diffraction measurements for almost 3000 different powdered chemical compounds is now offered in card form through a co-operative program sponsored by the American Society for Testing Materials and the American Society for X-ray and Electron Diffraction. Since interplaner spacings and intensities presented for each of these materials are strictly characteristic of that compound, identification is as positive as fingerprinting, according to National Bureau of Standards, Washington, which is directing a project to increase materially the number of indexed substances, and to improve accuracy of existing data.

FOUR-IN-ONE OPERATION—Such machines as the drilling machine with 4-station power driven index table and 4-station fixture employed to drill, end-cut ream and finish ream crankpins prior to broaching are instrumental in cutting down machining time some 20 per cent in the plant of Bendix Westinghouse Automotive Air Brake Co., Elyria, O. In the machine above, parts are loaded and unloaded at one station while tools are cutting at the other three positions. (p. 84)

VERSATILITY PAYS OFF—If a precision casting shop is to take best advantage of the adaptability of its investing materials, it must be prepared to melt metal of almost any description, with economy and control of metallurgical quality. Problem of melting metals for such a variety of production is a major one. A good melting system, it is emphasized, must be capable of melting almost any type metal or alloy; must be large enough in capacity to handle largest molds to be encountered, yet capable of melting charges that can be used completely while pouring the smallest molds. (p. 88)

HEFT TREADLE CONTROLLED— Blows of a steam hammer for forging are controlled by the operator and can range from a "tap" to a full blow of the hammer. Heft of the blow is regulated by means of a foot treadle which in turn governs amount of steam pressure added to the hammer. Full blow of a steam drop hammer, it is pointed out, is over twice as heavy as the blow of a board drop hammer of comparable size. (p. 91)

MEETS ACID TEST — Out on the West Coast, high percentage of nitric acid is used by Waldrip Engineering Co. to combine both picking and passivating actions in the same tank and at the same time. A solution of 3 to 6½ per cent total fluorides as hydrofluoric acid and 23 to 24 per cent nitric acid is employed at temperatures of 140-160° F. Depending on heat treatment the metals received prior immersion, the cycle in the solution requires 30 minutes to 4 hours. To meet such severe conditions, tank employed incorporates several novel features in its construction. (p. 101)

CONNECTING ROD MACHINING TIME AND

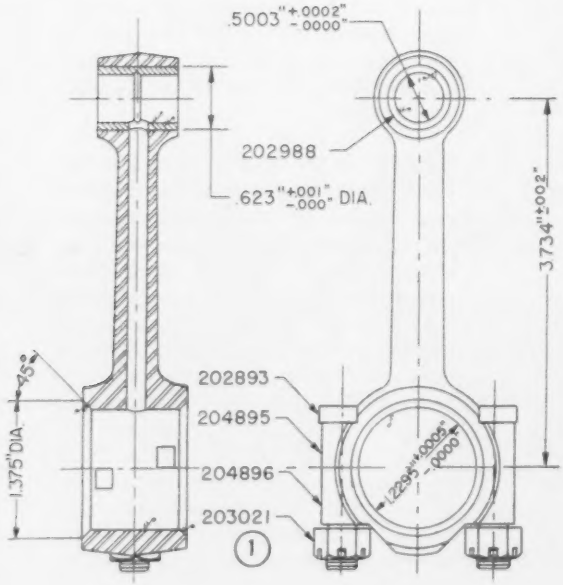
Cost Cut 20 Per Cent

. . . by careful utilization of equipment and shop area

TWENTY per cent reduction in time and cost of machining air compressor connecting rods and caps was recently achieved at the Elyria, O., plant of Bendix Westinghouse Automotive Air Brake Co., by establishing a new departmental setup for processing these engine components. Monthly capacity of the new manufacturing arrangement, Fig. 2, is 30,000 parts, based on a 5-day week with two 8-hour shifts per day. According to company engineers the final product is considerably improved, close tolerances met, and fewer rejects encountered.

Fig. 1 illustrates the type U air compressor diminutive counterpart of an automotive connecting rod. It is machined from a SAE 1045 steel forging heat treated to brinell hardness of 187 to 228. Eighteen operations are required to turn out the finished part.

Forgings arrive at the 28 x 64-foot machining area with both ends coined. The coining takes place on a 1000-ton Toledo press. First machining operation consists of grinding both ends on both sides on a Blanchard grinder, to tolerances of plus or minus 0.002-inch. Next, the wrist pin end is straddle milled to plus or minus 0.002-inch on a Kent-Owens milling machine.

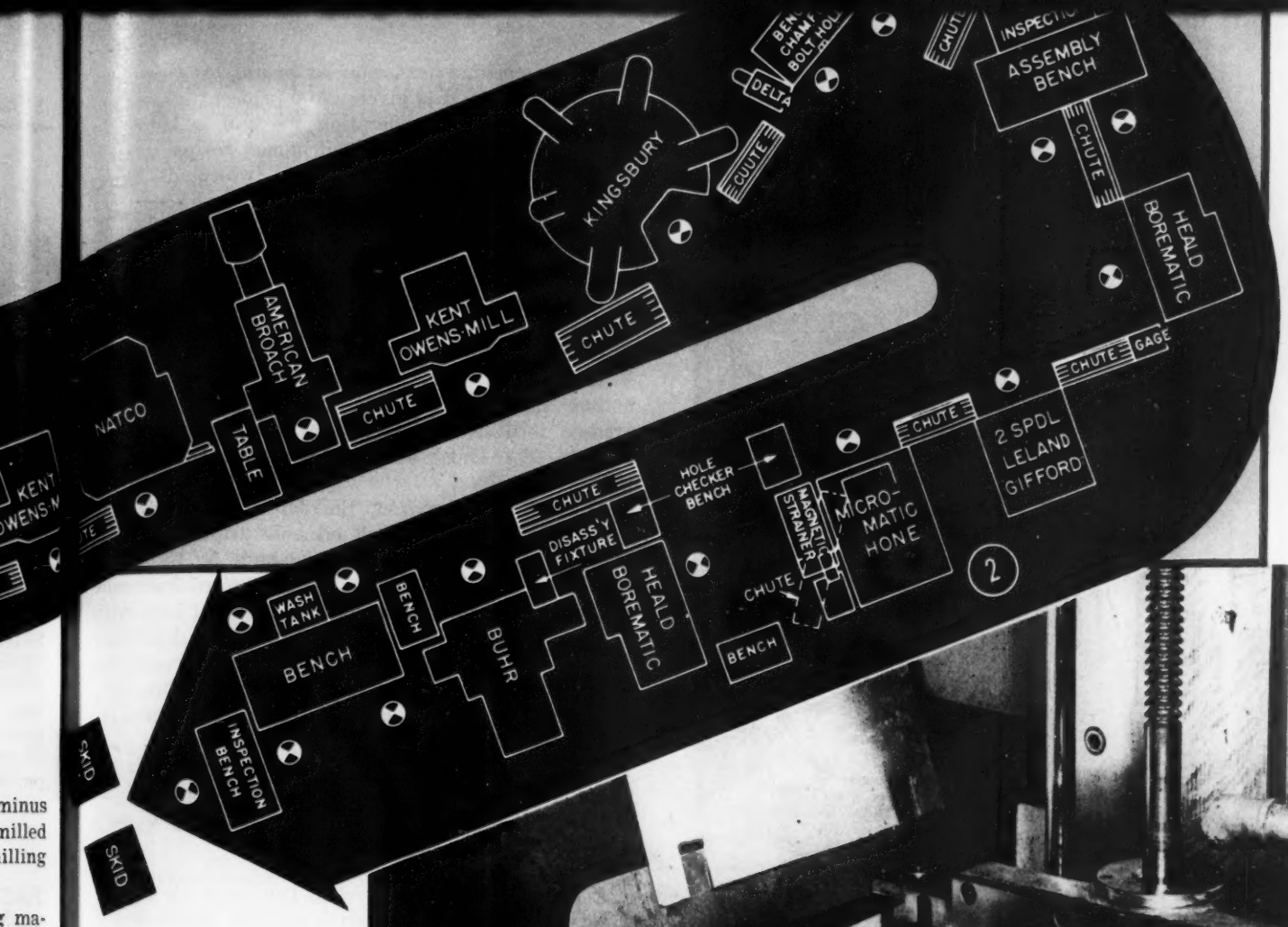


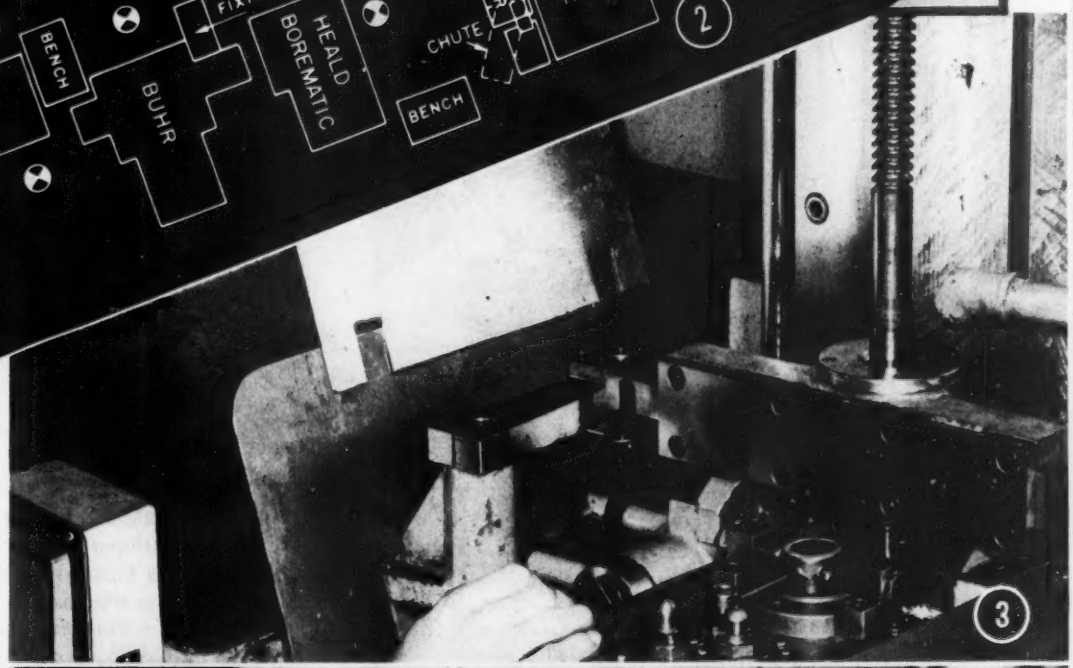
As shown in Fig. 4, a Natco multiple drilling machine with four station power driven index table and four station fixture is employed to drill, end cut ream, and finish ream the crankpin end prior to broaching. The parts are loaded and unloaded at one station while the tools are cutting at the three other stations. Wrist pin end is drilled, end cut reamed and finish reamed in the same fixture, simultaneously with the crankpin end. Parallelism of the two holes is held to 0.004-inch in 6 inches.

From the Natco the partially machined forgings move on to an American vertical broaching machine on which an oblong hole is broached, Fig. 3. This hole is made oblong, 5/32-inch, to allow for the saw kerf when the cap is cut off.

Next step is milling the bolt seats and sawing off the cap, using a Kent-Owens double-spindle milling machine, Fig. 7. Tolerances here are plus or minus 0.002-inch on center distance from milled face to wrist pin hole, and plus 0.002-inch across flats on the bolt bosses; the two joint faces on rod or cap are held in plane within 0.002-inch. Bolt holes are drilled and reamed and bearing insert positioning slot milled in both the cap and rod, on a Kingsbury horizontal multiple drill, Fig. 8. Tolerance on bolt holes and on diameter and width of insert positioning slot is 0.002-inch.

Wrist pin hole in the end of the connecting rod and bolt holes in both cap and rod are next chamfered on a Delta single-spindle drill equipped with a special bolt hole chamfering spindle. A double-end





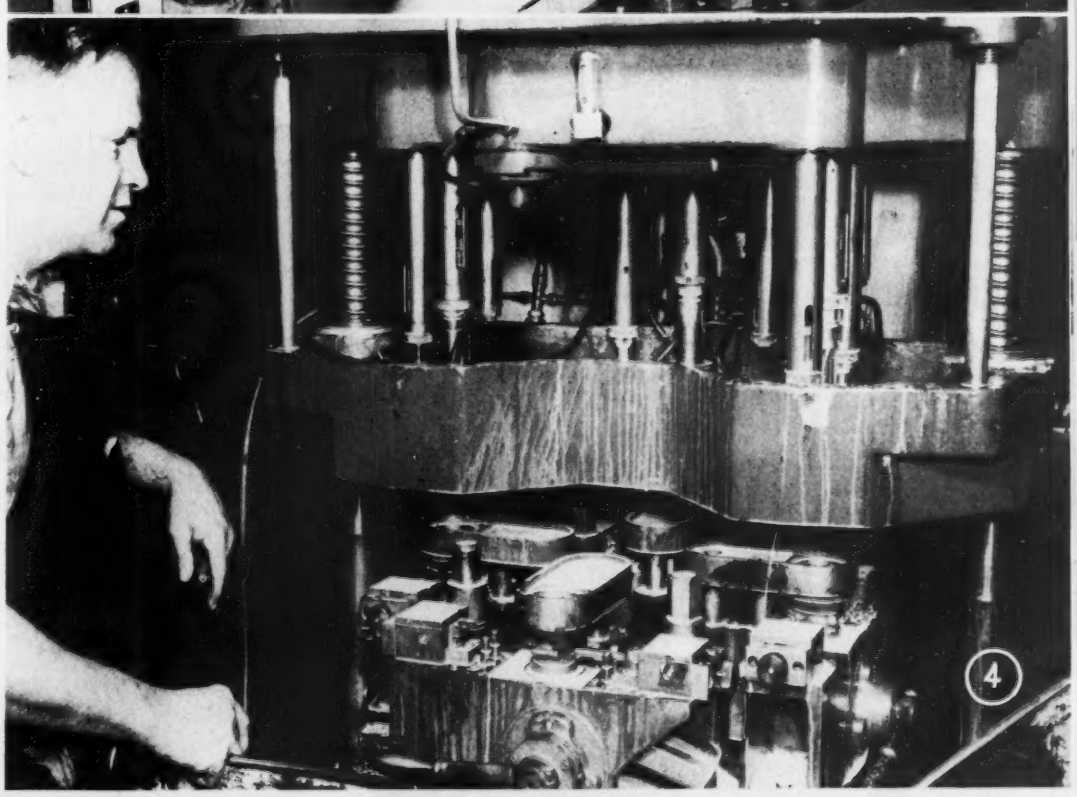
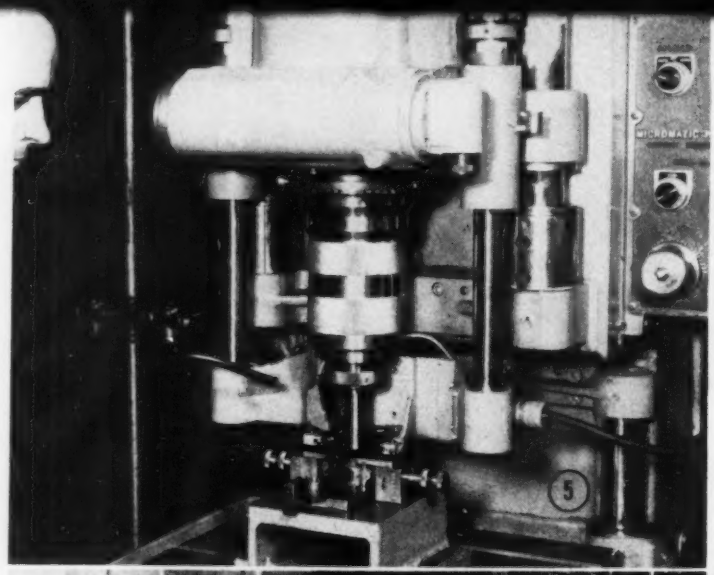


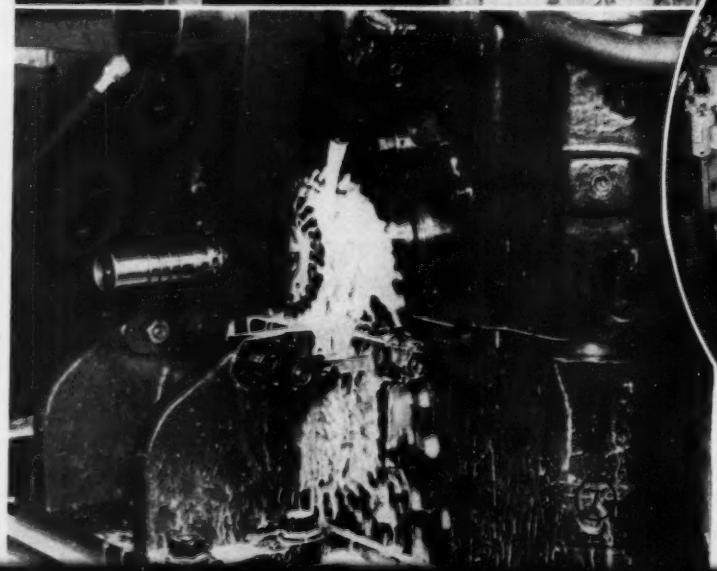
Fig. 1 — Connecting rod and cap, complete for type "U" air compressor

Fig. 2—Shop layout for machining connecting rods. Arrow indicates direction of flow

Fig. 3—Oblong hole is broached on this American vertical broaching machine

Fig. 4—Natco multiple drilling machine drills, end cut reams and finish reams crankpin end prior to broaching





polishing machine next removes burrs. At this point the connecting rod is given a 100 per cent inspection.

In another bench operation the cap is bolted to the rod, using an air-operated impact torque wrench and a special fixture. On a Heald two-spindle Borematic with carbide tooling, Fig. 6, both ends are bored, maintaining 0.0015-inch tolerance on the crank pin end and 0.001-inch on the wrist pin end. Wrist pin and crank pin bores are chamfered to a tolerance of plus or minus 0.005-inch on a two-spindle Leland-Gifford drill press.

Following the chamfering, the crank pin bore is honed to plus 0.0005-inch on a Micromatic vertical honing machine, Fig. 5. The bronze bushing is pressed into the wrist pin end and a Heald Borematic used to finish-bore to size, with a tolerance of plus 0.003-inch.

In the next operation, the cap is removed from the rod and the 3/16-inch oil hole drilled. This is done on a machine designed and built by Buhr Machine Tool Co. using three Leland-Gifford hydraulic step feed goosenecks mounted on a special base with a four-station index table and fixture. Finishing steps on the connecting rods consist of thorough deburring, washing in mineral spirits and blowing out; caps and rods are then assembled and given a final inspection.

Flow of parts from one station to the next is facilitated by the use of steel chutes. Location of these in relation to the machines and operators can be seen in Fig. 1.

Fig. 5—Following chamfering, the crank pin bore is honed to plus 0.0005-inch on this Micromatic vertical honing machine

Fig. 6—Heald two-spindle Borematic with carbide tooling is used to bore both ends

Fig. 7—Milling bolt seats and sawing off cap on a Kent-Owens double-spindle milling machine

Fig. 8—Bolt holes are drilled and reamed and bearing insert positioning slot milled in both cap and rod, on a Kingsbury horizontal multiple drill

Seen and Heard in the Machinery Field

By GUY HUBBARD
Machine Tool Editor

CORNELL—IN RETROSPECT: Back from the National Machine Tool Builders'-American Machine Tool Distributors' "Sales Refresher Course" at Cornell University (July 12-23) barely in time to do this page, I hardly have had time yet to review adequately this interesting and significant experiment in adult education.

First and foremost, let me say that my opinion expressed on a corresponding page in our issue of July 19—while in the midst of my work as a "student observer" in this course at Ithaca—still stands. That is "—that at Cornell there has been set a pattern in co-operative adult education which other universities and other industries will do well to follow". The reactions of observers from such well-known institutions of learning as Massachusetts Institute of Technology, Purdue University and Western Reserve University, and from such industrial and engineering groups as the press manufacturers, the screw products manufacturers and the American Society of Tool Engineers, certainly strengthens me in that belief.

One of the most impressive things about those two weeks on the Cornell campus was the high degree of concentration and attention to the work at hand which prevailed throughout the course. That can be accounted for in a number of ways. First, the students—both young and old—were impressed by their dignified surroundings. Second, the hours were long and the work intensive. Third, everyone was living "right on the reservation", with few attractions either business-wise or otherwise, to cause them to wander off the reservation. (The golf course was on the reservation but was not patronized by the students until after hours.)

Fourth, the whole thing was thoroughly planned in advance and the classes were managed with clock-like precision (even to a daily roll-call). Fifth, the sessions were so interesting and the urge to take notes was so strong, that no one wanted to miss a minute of the doings.

I have worked up a few hasty "statistics" to give some idea of the size of the job which had to be done by Tell Berna and Mrs. Frida Selbert and Dan Weedon and Herbert Tigges and Jim Hebert and Robert Giebel and Tom Fernley and Prof. Harry Loberg and Prof. C. I. Millard and more than 50 other people of the builders, the distributors, user-industries and Cornell University, who planned and contributed to and participated in this refresher course.

I now have on my desk 35 of the 47 papers delivered during the course—not including many very important discussions. Double spaced on 8½ by 11 inch paper, this collection makes a stack 2 inches high. My calculations indicate that these 35 papers total 123,600 words—with another 43,200 to come in the 12 other papers. If my arithmetic serves me well, the grand total will be 166,800 words—constituting the greatest manual on selling ever compiled by any industry.

And when I say "greatest" I don't mean merely in the volume of words, I also mean greatest in terms of its practical value as a selling tool. A tremendous job already has been done in getting this material together. A tremendous job remains to be done in correlating it and getting it into book form as I hope and believe will be done.

If any of the younger men went to Cornell with any idea that they were to be given any magic formula for success in machine tool selling, they got that idea knocked out of their heads before the course was over. What they learned first and foremost was that the average machine tool sale is the result of a lot of digging in hard, rocky ground. However, they also learned where to dig and how to dig—which is going to mean less non-productive work.

SENTIMENTAL JOURNEY: Over the week-end in the middle of our "Sales Refresher Course" at Cornell, Alvin B. Einig of Motch & Merryweather took George Pratt and me on a "pilgrimage" to Hammondsport, N. Y. to visit the haunts of the late, great aviation pioneer Glenn Hammond Curtiss. This is the 40th anniversary of his initial flights in his famous plane the "June Bug", about which I used to read with wonder in the weekly *Scientific American*.

As a young machine tool salesman, Mr. Einig—now one of the deans of that business—visited Hammondsport in the days when the intrepid Glenn Curtiss was building planes and engines there, testing his early "flying boats" above the waters of beautiful Keuka Lake at the south end of which Hammondsport is located, and "having-it-out" in the courts with the equally intrepid Wright brothers as to the relative merits and originality of warping wing tips and separate stabilizers.

We found that Hammondsport has pretty much reverted to its "pre-Curtiss" quietness—several famous wineries again representing its big business, as was true 50 years ago. Even the old Steuben Hotel—where good New York State champagne once flowed freely and pioneers in aviation foregathered—is only a memory. It burned to the ground a few years ago.

Glenn Curtiss is dead and all the industrial activity which he brought to Hammondsport has departed. The Wright brothers are dead. However, the names of these great inventors long have been linked in great industries operating elsewhere under the joint names "Curtiss-Wright". It is in the American tradition thus to compose differences and combine forces to the power and glory of American industry and the American way of life.

I hope that one day they get around to putting up a statue of Glenn Curtiss on the public square in Hammondsport. His genius as an inventor and his bravery as a pioneer aviator certainly rate that statue.

How To Prepare Metals for PRECISION CASTING

To take advantage of the adaptability of its investing materials, a precision casting shop must be prepared to melt metal of almost any description, with economy and control of metallurgical quality. Here the author suggests answers to some of the more pressing problems encountered in establishing efficient melting practice

METALLURGICAL problems encountered in producing molten metals to be poured into precision molds are unique because of the wide variety of alloys used, the small quantities involved, and the cleanliness and control required. Sand foundries, as a rule, specialize in single classes of material such as bronze, cast iron, steel, or malleable iron, since economical production requires the use of separate facilities, best suited to the peculiar requirements of each material.

While one may melt gray iron in a brass foundry crucible furnace, or brass in the arc furnaces of a steel foundry, neither of these operations can be considered as attractive from the cost or quality control viewpoint. An additional feature promoting specialization is the variation in the casting integument, the sand, facing, chills, etc. that best suit each of the materials commonly made in the foundry. Net result of the variation in demand for tools, material, and type of skill, is that in almost all cases sand foundries specialize in one family of metals, rather than attempting to make all types.

Precision casting produces a degree of dimensional perfection, good surfaces, and shapes that may not be economically fabricated by other means. Since the investing material adapts itself well to almost any of the castable metals, specialization in any base metal or alloy does not seem reasonable for the jobbing shop. The single exception would be those using calcium sulphate bonding materials which are, of course, limited both by decomposition temperature and by chemical reactivity of the bond.

If a precision casting shop is to take best advantage of the adaptability of its investing materials, it must be prepared to melt metal of almost any description, with economy and control of metallurgical quality. The problem of melting metals for such a variety of production is a major one.

A good melting system must be flexible, capable of melting almost any type of metal or alloy. It must be large enough in capacity to handle the largest molds likely to be encountered, yet capable of melting charges that can be used completely while pouring the smallest molds. It must be readily cleaned between batches or be sufficiently small and inexpensive to allow enough units to reserve linings for each type or class of metal likely to be encountered.

Introduction of excessive contamination (such as carbon) into high purity melts must be avoided. The melting system must allow ready control of both temperature and composition.

Best solution to the above requirements appears to be the high frequency generator (either rotating or electronic), coupled with interchangeable melting units. The power generator unit should be selected only after consideration of the normal melting charge to be handled, physical setup of the shop, rate at which molten metal must be supplied, and caliber of men available to operate the equipment.

Power Generators—Normal charge size is of importance in selecting the type of generator because stirring of the charge by magneto-strictive force is a function of charge size as well as of electrical frequency and rate of energy input. Frequency of commercially available high-frequency power generators may arbitrarily be divided into four general brackets: (a) Those in the neighborhood of 1000 cycles per second, (b) 10,000-cycle group, and (c) 100,000-cycle class and (d) generators operating in excess of 1 million cycles.

The fourth class can be arbitrarily ruled out at the present time because of difficulties in adapting these units to melting operations. Power of 1000 cycles may be produced either by motor generator or by mercury arc convertors. Stirring by magneto-strictive action is large at this frequency and, in small charges, is excessive. Caution must also be used with light metals since the stirring forces remain the same regardless of density. Generally speaking, the smallest charge that would be desirable for this type of power unit, would be not much under 100 pounds of metal. If larger charges are use, the equipment is desirable since power losses are less at these intermediate frequencies than at the high frequencies to be discussed later.

Power generators in the 10,000-cycle range are almost exclusively of the motor generator type. They require trained operators for most economical use in melting and are subject to somewhat higher power losses due to resistance and stray fields than are the

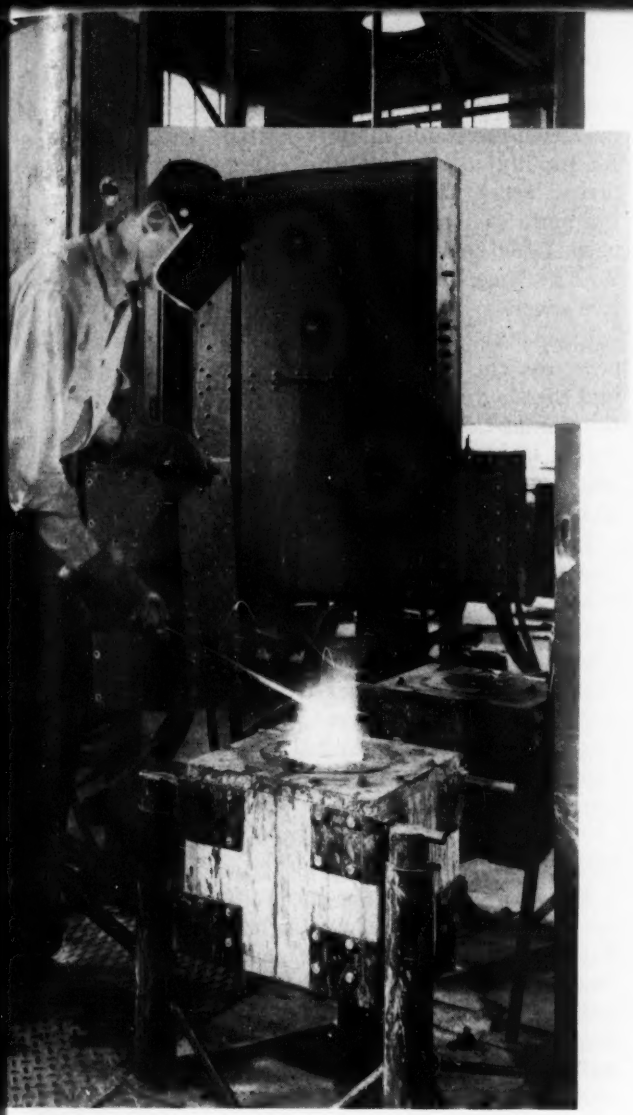


Fig. 1—Adding an alloying element to a melt at Allis-Chalmers' precision foundry. This 30 kilovolt-ampere, 9600-cycle induction furnace holds approximately 35 pounds of metal, enough for four or five normal-size flasks

1000 cycle units. They do, however, lend themselves well to melting charges as small as 4 to 5 pounds, and may be used in units of much larger size. Stirring in the molten charge is mild but continuous and effective, making the addition of alloying elements easy and certain.

The 100,000 cycle power generators are all non-mechanical, using an oscillator of either the spark gap or vacuum tube type. They may be used advantageously to put large amounts of power into very small charges, since the magneto-strictive action is mild. They have the added advantage of requiring minimum operator skill, since most of them are engineered to push-button and time cycle control. They are much more limited as to melting coil location, in reference to the generator location, since power line losses are large unless highly specialized techniques and conductors are used. In general, power sources of this type are applicable to the rapid melting of small amounts of metal for single molds.

Units of the 1 million cycle type are not used for melting but may show some value in dielectric drying or dewaxing.

By A. K. HIGGINS
Superintendent
Chemical and Metallurgical Laboratory
Allis-Chalmers Mfg. Co.
Milwaukee

Each of the above generators requires a melting unit for application. The type of unit, its size and location will depend on the individual need of the shop. The simplest consists of a properly designed, water-cooled coil surrounding a crucible which serves both for melting and pouring. Somewhat better engineered designs using firm mountings for the coil, the monolithic rammed linings, offer the opportunity of additional metallurgical control by the choice of lining materials. Other modifications of the furnace unit, to permit the use of controlled atmospheres, vacuum and pressure melting, etc. are limited only by the ingenuity of the designer.

Metallurgical Control—Question of metallurgical control is of prime importance in making precision castings. If the potential advantages of the process are to be fully realized, castings must be uniform in composition and in physical properties. This is particularly true of steel castings, to be used after heat treatment, since variations of composition, even within normal specification ranges may change the heat treatment required for optimum properties.

If the melting process is to have adequate control it must, of course, start with select materials. It is common practice to remelt wrought material of the composition ultimately desired. This method is not without hazard, however, as the normal variations in furnace behavior result in varying degrees of oxidation or reduction of the charge, particularly on the first several melts. This will probably not be of great consequence in the mild steels but may be a source of considerable difficulty with high carbon, highly alloyed, or extremely low carbon steels. It would seem to be the only practical method for shops melting in single mold quantities.

If this procedure is to be followed, it is probably best to select, with the assistance of a steel supplier, heats of steel that are of such composition as to return to the desired analysis on remelting, and to stock considerable quantities of such steel when good lots are found. This method of melting may also be used with "master heats" of the desired alloy replacing the wrought material. The system of master heats offers the possibility of correcting composition to compensate for the vagaries of the melting unit chosen, but involves installation of large equipment, or the purchase of the corrected alloy desired. It may be necessary in any case, if certain patented alloys are to be cast.

Fortunately, when larger amounts are melted in a single charge, it has proved practical to alloy and correct the composition in the furnace, rather than to depend on other sources for quality control. Choice of raw materials is still of prime importance and only good grades from reputable sources should be considered. Laboratory analysis of each lot of raw material received should be made part of routine procedure.

Raw Materials—Raw materials required for the

manufacture of most of the common alloys will include high purity iron of the Armco type, low carbon grades of ferromanganese, ferrochromium, and ferrosilicon with, perhaps ferroalloys of molybdenum, vanadium, tungsten, and titanium. Carbon may easily be added as by the use of remelted and chill cast pig iron of the kind familiarly known as "charcoal pig."

These alloys are not the most economical to use when a large amount (for the precision casting industry) of a single type of steel is to be made. Available wrought scrap and less pure ferroalloys may then be used to advantage, since there is time to work out the necessary procedures required with their use.

In any case, charges are small as compared to normal steel foundry practice and little or no refining is accomplished in the melting furnace, although there may be considerable losses of silicon, and carbon. Gates and scrap castings may be used back in the charge with good success if rigid segregation of returns is maintained. This is of particular importance for precision casting since the recoverable value of scrap is such a small part of the total value of the castings produced. Where serious contamination of the returns is suspected, it is much better to sell the material as scrap than to attempt its use in castings.

Furnace lining materials will commonly be basic or neutral in character to avoid excessive lining erosion by slags, which are normally basic in character.

Melting and Alloying—Melting and alloying procedure will vary with the metal used. Since refining to any considerable degree is not commonly done in these small furnaces the most efficient melting without major loss of alloys, is the desired result. A typical melting procedure for high alloy steels would consist of melting the iron first, together with any oxidation-resistant alloy required, such as nickel. As rapidly as the melting charge permits, the returned scrap should be added and melted. Finally, the more easily oxidized alloy and part of the silicon needed for deoxidation are added at about the same time as lime, the purpose being to provide a protective cover.

When the charge is heated to the desired temperature, the balance of the silicon should be added and the slag removed before the heat is removed from the furnace. Slags with insufficient fluidity are corrected by the addition of small amounts of fluorspar. More active deoxidizers may, if required, be added to transfer ladles if they are used.

It may readily be seen, that maintenance of control requires the most rigid observance of good practice. Scheduling of heats should not only describe the new metal to be charged, but also the precise amount of returns to be included in the charge, and the makeup alloys required to compensate for melting losses on the returns. While it is not always practical to make chemical analyses of each heat, samples should be taken at frequent intervals and checked for the transient element, with complete chemical analyses being made at less frequent intervals.

Physical tests of the metals produced must also be made if the highest quality of product is required. Frequently, slight modification of chemical specifications, or more rigid control than is formally specified will be required if maximum physical properties are desired. Information of this type can be obtained only by careful comparison of physical properties, chemical analysis, and microstructures, derived from physical tests.

Generally speaking, careful control of melting to sound metallurgical principles coupled with proper equipment will produce metal whose physical properties compare favorably with those obtained by other means of fabrication. The only result that cannot be obtained by proper control is a worked structure with its attendant properties.

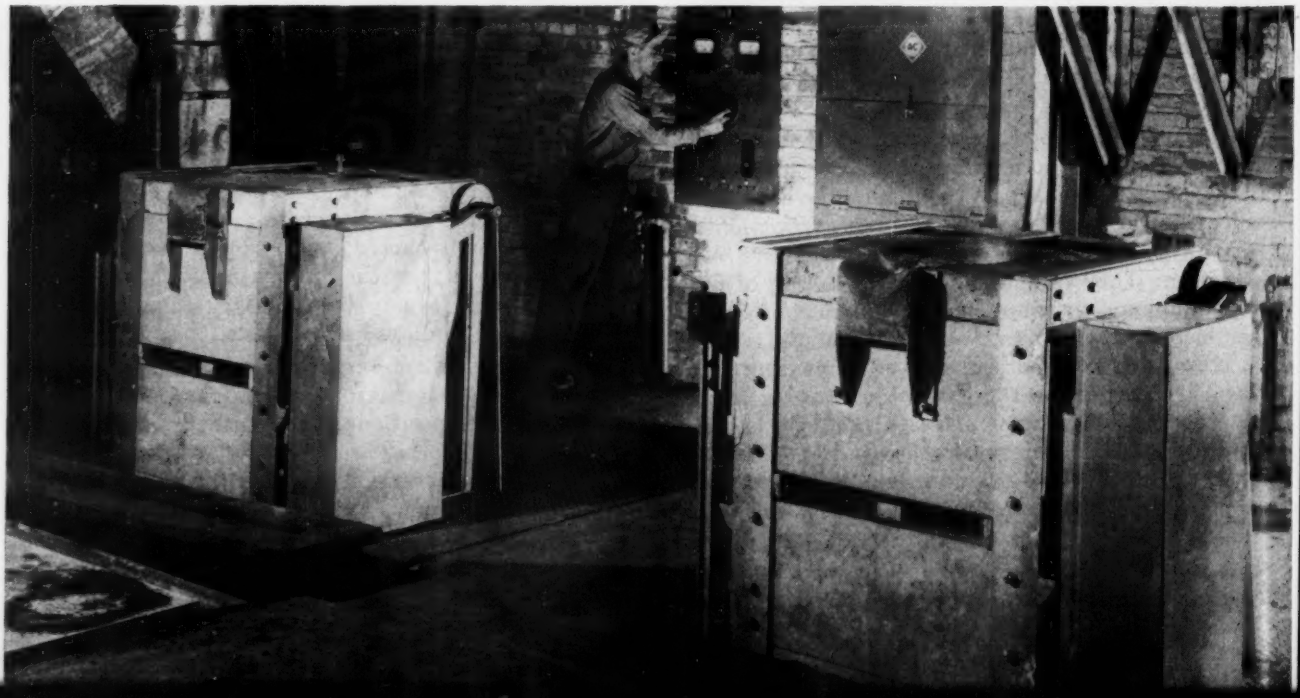


Fig. 2—Installation of large induction melting furnaces at Michiana Products Corp. Each of these 1000-cycle furnaces holds about 650 pounds of alloy steel

By WALDEMAR NAUJOKS

FUNDAMENTALS OF Forging Practice

Various types of forging equipment, including helve power and general forging hammers, hydraulic presses, board and steam drop hammers, forging machines and rolls are described in this fifth part of the series

Previous articles in the current forging series appeared in the following issues of STEEL: June 7, p. 100; June 21, p. 98; July 5, p. 76; July 19, p. 99.

PREVIOUSLY consideration has been given to the flow or movement of the metal when the metal was in the plastic condition and when that metal was moved by impact pressure or by push pressure. Attention was on the importance of the movement in accordance with the simple and natural laws of the flow of plastic metal, in changing the shape from that of a bar to that of the finished forging.

Methods were described by which the metal could be steered or coaxed to the position desired. However, forgings vary in shape and size, and they are made in a variety of metal compositions. It is desirable to know just what kinds of forging equipment are used in producing the various types and sizes of forgings, and what methods are used to determine the proper type and size of forging unit for a given forging.

Nearly all of the early forging work was done under power hammers between flat dies. For centuries the anvil was the symbol of the blacksmith; not much thought was given to changing the shape of the dies and tooling in making the various types of forgings. Power hammers were designed and built with a motion that copied, as closely as possible, the action of a man striking hot metal with a two-handed sledge hammer. Up to the time of the development of the forging machine and the forging press, all of the forging was done by striking hammer blows, are exerting "impact pressure."

Impact and Continuous Pressure—Today, forging is done by impact pressure or hammer blows, and by continuous pressure. Impact pressure is an intermittent pressure, with a series of blows being required to perform a given step in the forging process. Continuous pressure is delivered by the press type of forging equipment; pressure is continuous until the press ram is ready to release the pressure.

Difference in the types of pressure may be shown. Picture the blacksmith with a piece of hot steel on the anvil. He strikes a blow on the steel to flatten it by ¼-inch. At the moment his hammer face touches the hot metal, the hammer head has the maximum energy available. As the hammer face sinks into the hot steel to flatten it, the energy in the hammer head is reduced until the metal stops moving. At the instant the hammer head stops moving and the blacksmith is ready to raise it to strike another blow, the only energy remaining in the hammer head is the actual weight of the hammer head. In other words, the potential energy in the head changed from maximum to minimum energy. In the forging machine or the forging press, the maximum is at the end of the stroke. Both types of the press punch touches the hot metal. Pressure against the hot metal increases until it reaches its maximum at the end of the stroke. Both types of energy are useful in making forgings and they are employed in many ways.

Helve Power Hammer—The helve power hammer,

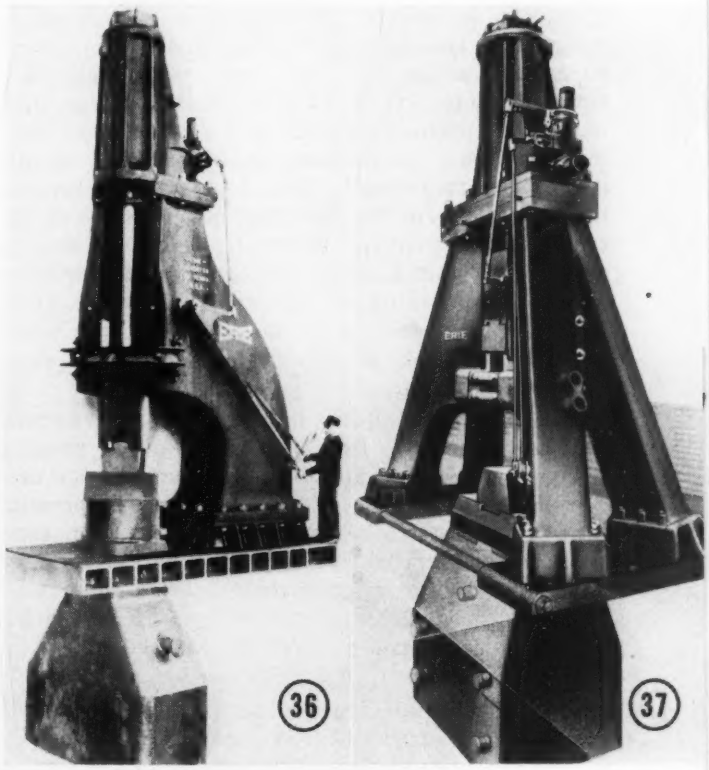
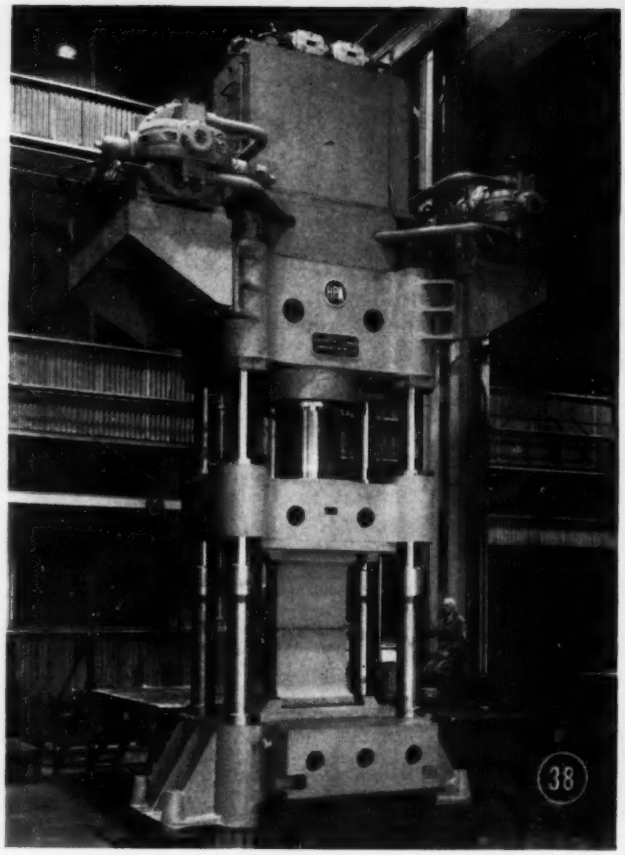
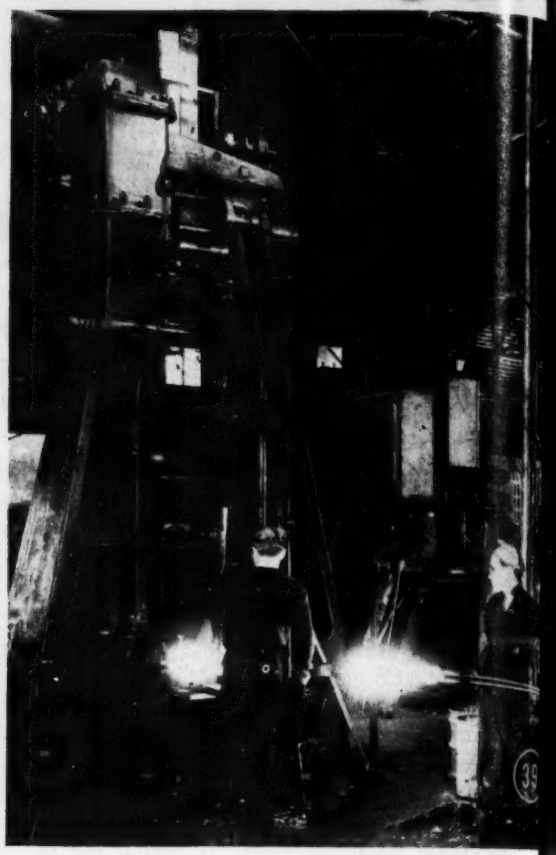


Fig. 36—Typical single frame forging hammer. Courtesy Erie Foundry Co.

Fig. 37—Double frame flat die forging hammer. This 16,000-pound unit is used for cogging down ingots prior to rolling into bars. Courtesy Erie Foundry Co.





first developed for use with water power, is being used today, but with modern power operation and design. This hammer is a small fast forging tool that finds many uses in various types of forging work. It is used for drawing down forging stock, for making and dressing various kinds of tools such as chisels, picks, bars, and many other tools of a similar nature. It is used as an aid to the drop hammer in performing some of the preliminary forging operations. It delivers impact pressure, usually called "hammer blow". This tool is rated for size by the weight of the striking ram into which the top or striking die is fastened. Range in sizes is from a 15-pound hammer which is used for dressing chisels and working on forging stock up to about 1 inch in diameter, up to the 500-pound size which is used for work on billets and bars up to about 5 or 6 inches square.

While much of the forging work in the helve power hammer is done on flat dies, fullering dies, swaging dies, spreading dies, and drawing down dies are used for various types of forgings. Small impression dies are used in this type of power hammer, especially if it is provided with ram guides, to make forgings alike on a production basis. These tools strike very rapid blows, at the rate of 250 to 300 a minute for small sizes to 175 a minute for the large sizes.

A similar small type of mechanical hammer is the power hammer which is designed to change the circular movement of a rotating shaft to the vertical up-and-down movement of the striking ram. Fast circular rotation of the crankpin is transmitted to the ram by means of a diamond type connection. Diamond connecting links are spread apart by a spring and the fast rotation of the crank pin gives a sudden downward thrust to the ram, similar to the cracking of a whip. These hammers range in size from about 15 pounds to approximately 250 pounds.

General Forging Hammers—General forging hammers used for the blacksmith types of forgings, are built along the general design of the original Naysmith forging hammer. The ram, or striking weight, moves up and down between a set of guides. Work rests upon the anvil die which is fastened to the anvil of the hammer. In his hammer, Naysmith used steam power to raise the hammer ram and it was permitted to fall free to strike the blow. The modern general forging hammer also uses steam or air power to help strike the blow.

Most of the general forging hammers are operated by steam pressure, but air pressure is used to operate some of them. In general, steam is obtained from the steam power plant. Where compressed air is used it is taken from an air compressor. Pneumatic power hammers, where the compressor unit is built directly in the forging hammer, are finding considerable use. Smaller sizes of general forging hammers are operated by means of a foot treadle; they require only one man to operate them. Larger sizes of general forging hammers are operated by hand levers, so a hammer operator is required to assist the hammersmith.

Small and medium sizes are built with a single frame; they are called single frame forging hammers or "C" frame forging hammers. Medium and large sizes use two frames and are termed "double frame." Size of the general forging hammers is given by the weight of the striking parts which include ram,

Fig. 38—This 1000-ton flat die forging press has advance and return press ram speed of 560 inches per minute; forging speed at full load is 105 inches per minute. Courtesy Hydraulic Press Mfg. Co.

Fig. 39—Board drop hammer. Courtesy Chambersburg Engineering Co.

Fig. 40 — 20,000-pound model E steam drop hammer. Courtesy Chambersburg Engineering Co.

piston rod and piston head. Sizes range from about 100 pounds to 20,000 pounds. Fig. 36 shows a single frame forging hammer. Fig. 37 shows a double frame forging hammer.

General forging hammers can be operated to use the full range of impact blows, from a light fast tap to the full blow of the hammer. Largest ingot that can be handled by the largest general forging hammer is about 35 inches in diameter. It has been found impractical to build and use general forging hammers larger than about 20,000-pound rating.

Hydraulic Presses—Larger forgings than can be worked in the larger sizes of the general forging hammer, are forged in large hydraulic presses. These presses do not create the vibration that the large forging hammer does, because the forging pressure is a squeeze pressure. Hydraulic forging presses, used for general forging work, range in size from about 500 tons forging pressure to about 15,000 tons forging pressure. All forging presses are rated in tons of maximum pressure they can deliver.

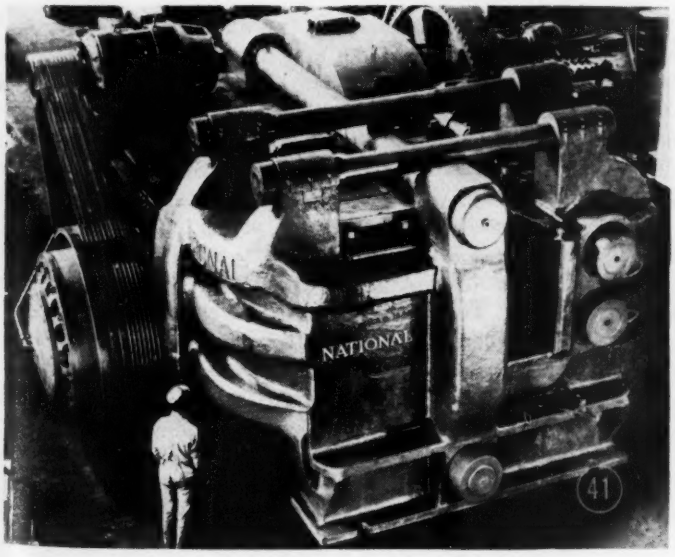
Largest hydraulic forging presses will forge ingots up to about 70 or 80 inches in diameter. They are used for working down large steel ingots into various forgings, such as large shafts for ocean vessels or for large turbo-generators, making forged die blocks, crankshafts, rudder forgings, and similar large parts up to and over 200 tons in weight. Fig. 38 shows a typical hydraulic forging press. Many of the existing hydraulic forging presses are operated by steam power. Some of the newer designs are operated by a series of pumps which compress water or oil to deliver the hydraulic power to the press.

Drop Hammers—Drop hammers are among the principal forging tools for making impression die forgings, commonly known as drop forgings. General design of the drop hammer includes the anvil which is the heaviest part of the hammer unit, and also known as the hammer base. Guide columns rest upon the outer sides on top of the anvil. The head of the unit, which contains the power unit for operating the hammer, rests on top of the two column units. Main moving part of the drop hammer is the ram. Top die is fastened to the ram and does the striking.

The term "drop hammer" is a name left over from the early days of the drop hammer. At that time, the ram was raised by the use of a rope or a belt and when the top of the stroke was reached, the ram was permitted to drop, striking the blow. In the modern drop hammer, the ram is kept in alignment in its up-and-down movement by means of V-shaped guides. The vees are in the sides of the ram and fit into corresponding vees in the column

Fig. 41—Nine-inch high duty forging machine. Courtesy National Machinery Co.

Fig. 42—Typical forging machine. Courtesy Hill Acme Co.



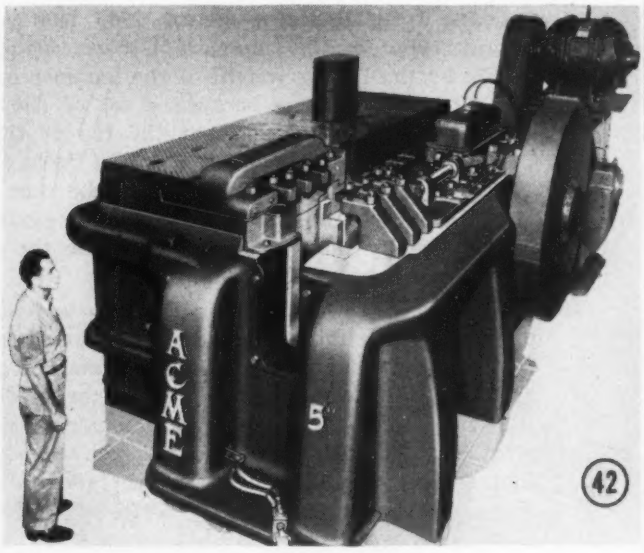


Fig. 43—1000-ton mechanical forging press. Courtesy Ajax Mfg. Co.

guides. Two general kinds of drop hammers are used—the board drop hammer and the steam drop hammer.

Board Drop Hammer—Board drop hammers are gravity type forging hammers because the blow is struck by the falling weight of the hammer ram and die. It gets its name because a set of flat boards are fastened into a pocket at the top of the ram. The boards extend through a set of rolls, one on each side of the flat boards. When the ram weight is to be raised, the rolls come together against the boards and by their rolling action raise the ram to the top position.

When the top position for the ram is reached, a pin in the ram trips the rolling mechanism so that the rolls spread apart and a set of steel dogs grip and hold the ram in the top position, by holding the boards in their grip. When a hammer blow is desired, the holding dogs are released by means of a foot treadle which permits the ram and die to fall free to strike the blow. If a series of blows is desired, the foot treadle is held down with the foot.

It has been found that maple boards work best for this service, when suitable friction for raising the weight is considered, along with board life and continuous service. Drop hammers are rated in size by their falling weight, which in the board drop hammers is the weight of the ram and of the boards. Board drop hammers range in size from about 200 to 7500 pounds. Fig. 39 illustrates a typical board drop hammer of the motor driven type. Note the motor mounted above.

Steam Drop Hammer—Steam drop hammers are so-called because the majority of them are operated on steam power. With slight changes to the valve mechanism and to the fit of the piston rings, they can be operated on compressed air of about equal pressure. Steam drop hammers are similar in appearance to the board drop hammers. The steam cylinder is mounted on top of the frames in place of the board drop hammer's roll head. Steam pressure is used to raise the weight of the ram to the top position and steam pressure is added to increase the force of the blow in striking, so that a much harder blow is given. Heft of blow in the steam drop hammer is regulated by a foot treadle; it can be of any heft at the will of the hammer operator, from a very light tap to the full blow of the hammer. The ram is guided by vee guides in the same manner as it is guided in the board drop type.

Steam drop hammers are able to produce a larger variety of drop forgings than is the board drop hammer. The steam drop hammer is also rated by the weight of its falling parts which includes the ram, piston rod and piston head. Full blow of a steam drop hammer for a given size is over twice as heavy as the blow of a board drop hammer of the same rated size. For example, the heft of blow in a 3000-pound steam drop hammer is more than twice the heft of blow in a 3000-pound board drop hammer. Steam drop hammers are used in sizes from about 500 to about 50,000 pounds. Fig. 40 shows a typical steam drop hammer.

Anvil Weight—Weight of the anvil drop hammers is in some proportion to the weight of the hammer ram. Some drop hammers have the anvil weight 20 times the ram weight and others have a weight ratio of 25 to one.

Dies are fastened to the anvil and to the ram by means of die shanks and die slots. Sides of the die shanks have a small taper and the die slots in the ram and in the anvil have a similar taper. Dies are fastened tightly by means of a tapered key which is driven on one side of the dies. Since frequent changing of dies tends to wear the die slots, the anvil slot of most drop hammers is protected by an anvil cap which is fastened into the anvil. Dies are then fastened to the anvil cap which is also called the sow-block. The anvil cap can be changed from time to time when it is worn out. Side angles of the shanks and die slots are usually about 6 degrees.

Board drop hammers strike a fixed blow while the steam drop types can strike a variable blow. Advantage of the board drop hammer for production work is that it can be operated from a power line shaft by the use of belts or by electric motors mounted on top of the hammer. Its operation does not require as much skill because the blow is fixed and the operator knows the number of blows required

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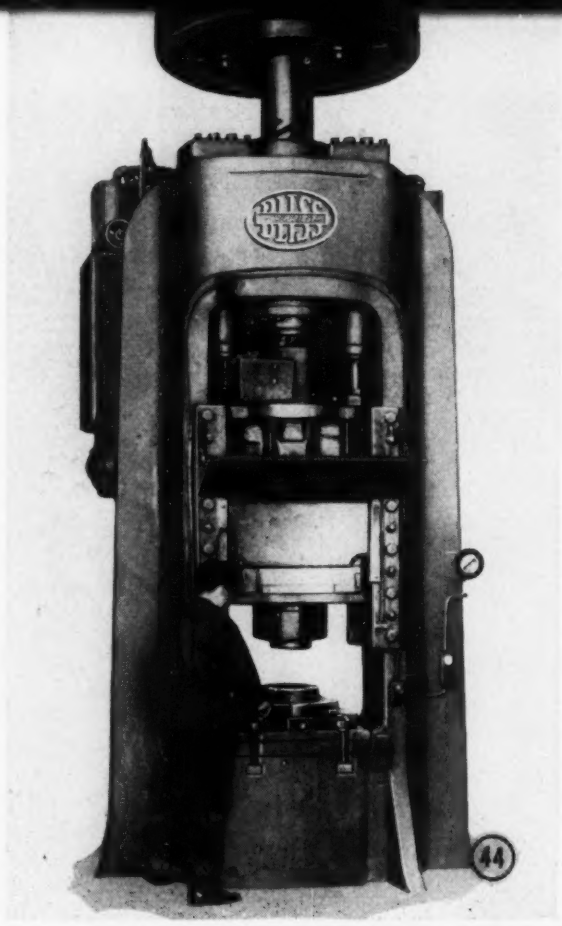
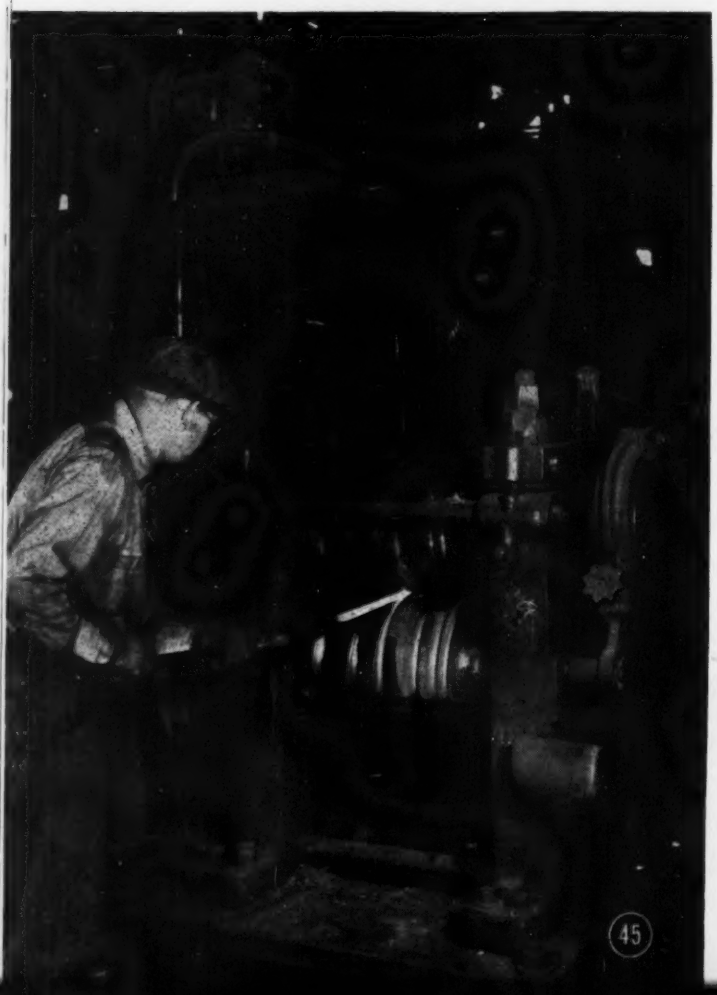


Fig. 44—Operating principle of this 600-ton hydro-screw press employs a flywheel at the top of the screw which is brought up to speed by hydraulic pressure. This press utilizes the accumulated energy developed to deliver a quick, uniform hammerlike blow. Courtesy E. W. Bliss Co.



in each of the various forging operation steps.

Its disadvantage is that the board drop hammer cannot forge the variety of forgings that can be made in the steam drop hammer, because of the flexibility of blow of the steam drop hammer.

Electric power is usually available in all industrial plants, so power for the board drop hammer is available. For the steam drop hammer, a steam power plant must be available, or if the drop hammer is operated on compressed air, a suitable air compressor must be available. The normal steam or air pressure at the drop hammer is from about 90 to 100 pounds. The board drop hammers produce forgings weighing from 1 ounce to about 100 pounds. Steam drop hammers make drop forgings up to about 4000 pounds when using the largest hammer.

Forging Machines—A forging machine can be considered a press that operates in the horizontal position. Like a press, it does the forging work by means of continuous squeeze pressure. It is a double acting machine, gripping round stock by means of a pair of dies which come together to grip, and then delivering push pressure against the stock to be forged. In the open position, a pair of dies (termed split dies) are apart, leaving space between them. The bar stock is placed between the open dies against the stationary die.

When the foot treadle, or the starter button is pushed, the first part of the forging cycle starts, moving the movable die against the stationary die to grip the forging bar tightly. The bar is placed between the dies so that the right amount of metal is left in the open for the forging operation. Second part of the cycle is the movement of the punch against the forging stock to push it, under a powerful push, into the die cavity provided for it. Grip of the modern heavy duty forging machine is just as powerful as the push when the gripping dies are closed; and the machine can be used for squeezing stock as well as for upsetting or gathering stock.

Important requirement of the modern forging machine is rigidity. All moving parts must have ample strength and they must be fitted to close accurate alignment. Forging machines are designed with safety devices, which operate if too much metal is put into the machine, and release the machine before damage is done to the crankshaft or other parts. Figs. 41 and 42 show typical forging machines.

Size of the forging machine is given in inches. The size rating has been carried over from the days when the machine was originally a bolt heading machine. At that time, the size rating in inches was given to indicate the largest diameter of bolt that the machine would make. For example, a 1½-inch bolt header could upset stock to provide a standard bolt head on a bolt 1½-inch in diameter.

Today, only experience in forging machine work can be used as a guide to know the top capacity of a forging machine of a given rating. The forging machine, in addition to making a large variety of forgings completely in the machine, is used together with drop hammers to make forgings. In some cases,

Fig. 45—Forging Rolls. Courtesy Interstate Drop Forge Co.

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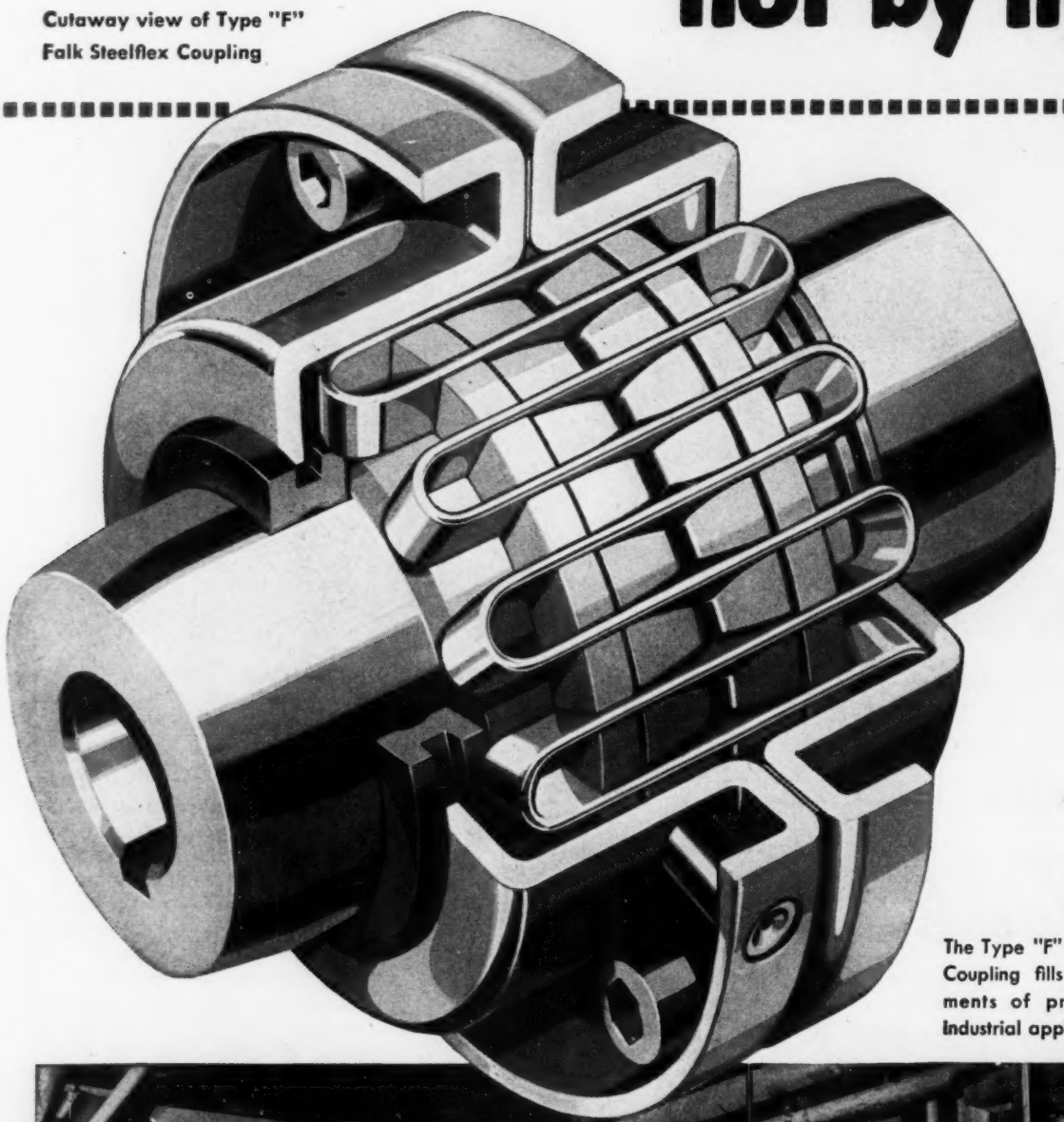

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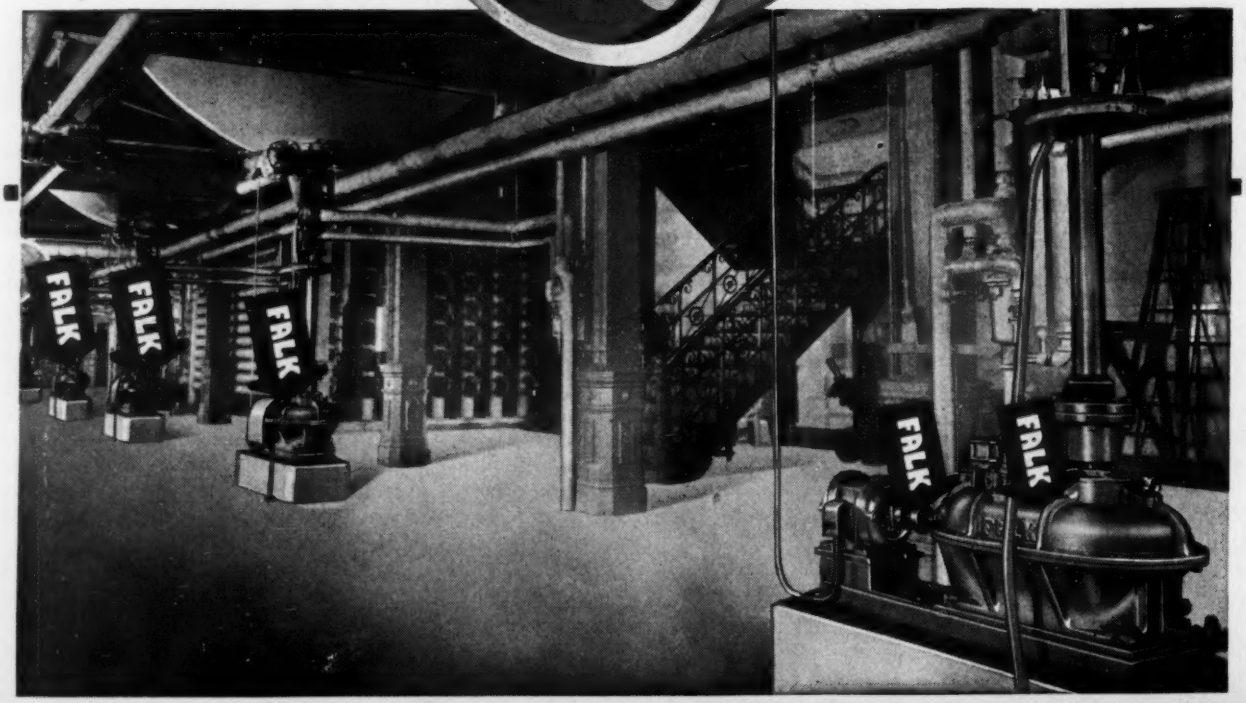

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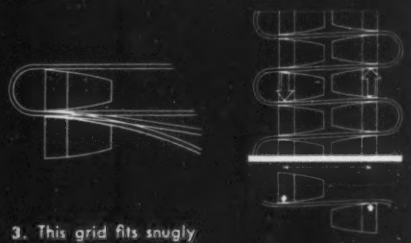
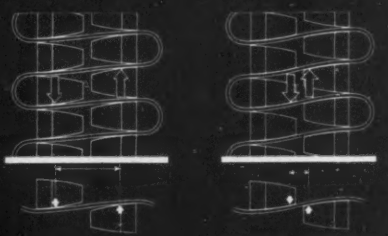


3. This grid fits snugly into the curved grooves cut into the hubs of the coupling. The grooves provide a scientifically cut bearing surface for the grid. This bearing surface extends from the outer to the inner edge of the grooves. The grid bears on the grooves in proportion to the load.

4. Under light loads, the grid bears only at the outer edges of the grooves. This permits a long, free, elastic span between the outer edges of both hubs. Power is transmitted through almost the entire length of the grid rung.



5. Under normal loads, the grid bears on a larger area of the grid grooves and the span of the grid run is shortened. It transmits more power and maintains its capacity to absorb shocks and dampen vibration.

6. Under peak loads, the grid rungs bear over almost all of the curved surfaces of the grooves. The span of the grid rung becomes very short. Under the impact of shock loads the grid flexes and continues to transmit power smoothly.

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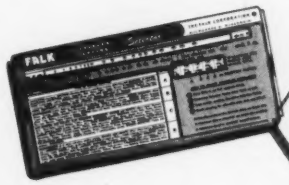

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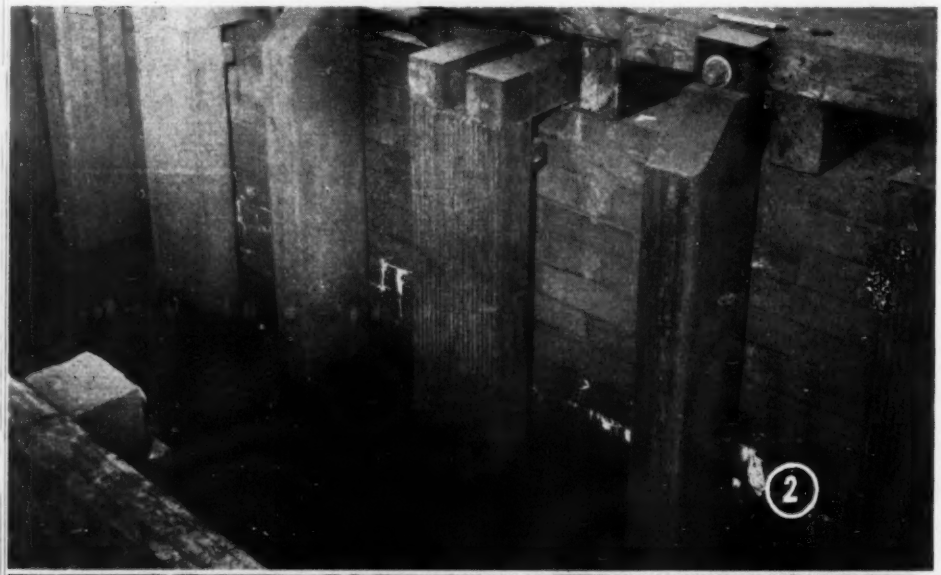
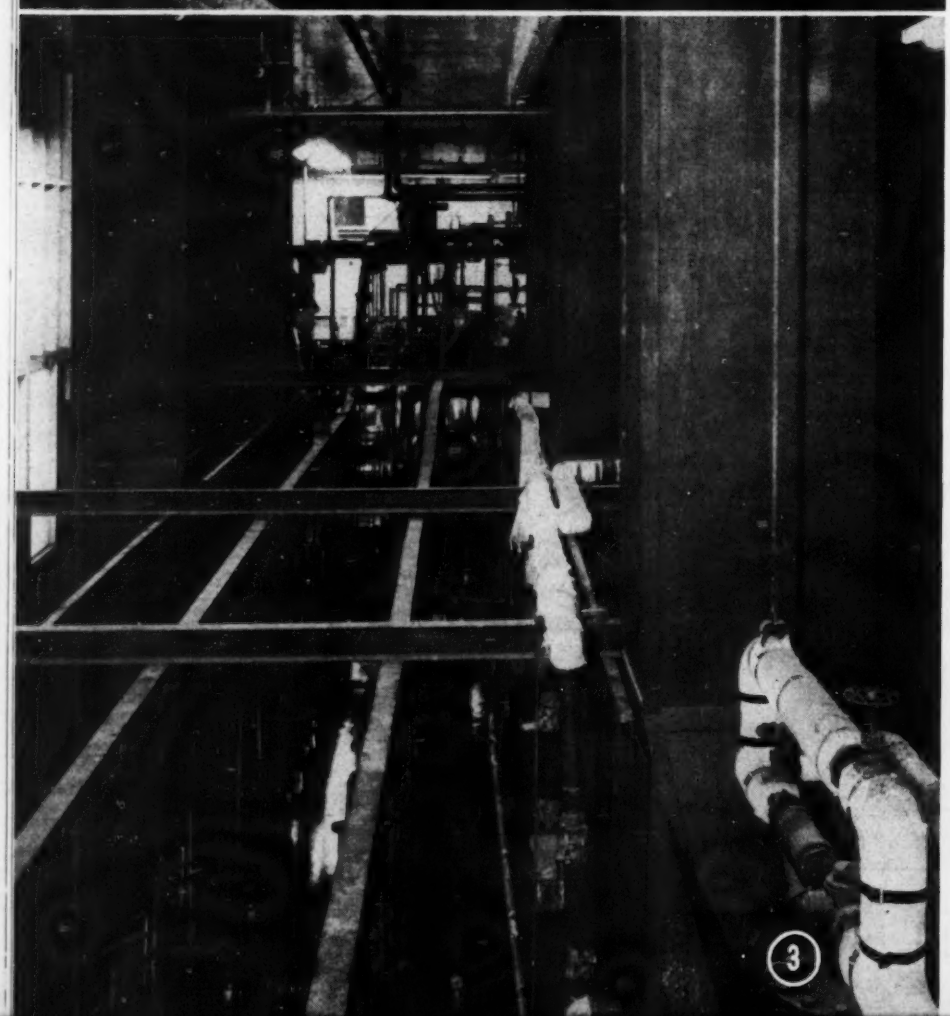
sides, after which a single course lining of 9000, standard size, National Carbon Co. brick was laid over the membrane, the cracks between the bricks being sealed with hot Basolit cement. Bottom brick were laid on edge and side wall brick stacked flat in the usual manner, thus providing 4½-inches of insulation at all points between the pickling fluid and the membrane. Since coefficient of thermal transfer of carbon is only approximately [3 Btu/(hr) (sq ft) (°F/ft)] compared with 26 Btu for mild carbon steel, it was calculated that this depth of carbon would provide adequate protection for the membrane.

Since graphite possesses a very high coefficient of thermal transfer [75 Btu /(hr) (sq ft) (°F/ft)] compared with carbon's low heat transfer rate, and is equally resistant to HF-HNO_3, Karbate impervious graphite plate heaters were chosen as exchangers. Nine heaters of this material are installed vertically around the sides of the tank, being operated with steam at 20 pounds square inch gravity.





In use since May, 1946 and inspected on three occasions when the tank was drained and cleaned, the carbon brick and Karbate exchangers "have proved to be unaffected by nitric and hydrofluoric acids at the concentrations and temperatures employed, and there is no evidence that the expectant service life of the materials has been reached by this application," according to the plant's process engineer.

The tank has 325 square feet of surface area. Fluid level is maintained at about 28 inches depth, with 5260 gallons of pickling solution in the tank. To replace evaporation and drainage losses, make-up chemical and about 3 inches of water are added daily. The cold solution can be raised to operating temperature in about 12 hours; overnight temperature drop is raised in one hour. Overall heat transfer performance is said to be excellent. Only maintenance problems are protection from corrosion of the steel steam pipes leading into the heat exchangers and installation of flexible couplings on the nipples of the exchangers to avoid breakage from misalignment of connections, or other causes.

Containers weighing 26-27 pounds each are circulated through the tank by suspension in travelling racks which traverse the length of the tank, circle at the wide end, and return. This system permits 46 containers to be immersed at one time. Racks and their steel sink weights are protected by a vinyl coating.

Construction of the tube pickling tank at Pacific Tube Co. is essentially the same as that at Norris Stamping, being a single course of National Carbon Co. brick over a

Fig. 2—Nitric-hydrofluoric acid pickling tank installed at Pacific Tube Co. Inside walls are of carbon brick, plate heaters are of Karbate impervious graphite and all have proven highly resistant to the acids at the temperatures and concentrations employed. Liners serve to protect the exchangers and side walls from the bales of tubes and hold tubing off floor of tank so pickling fluid can reach the bottom of the bales

Fig. 3—Pickling tank, 49 feet in length, is lined with carbon brick to a point above the fluid level and heated with Karbate graphite exchangers. Pickling fluid is 2-6 per cent hydrofluoric and 6-12 per cent nitric at 140-160° F. This installation at Norris Stamping & Mfg. Co.

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National METAL EXPOSITION

PHILADELPHIA—OCTOBER 25 thru 29, 1948

Koroseal membrane inside a steel shell. The inside length is 26 feet 4 inches, the width 4 feet and the depth 4 feet 4 inches.

Eight, steam-fed, Karbate plate heaters maintain an operating temperature estimated to vary from 140 to 160° F. The 1092 gallons of fluid are allowed to chill at night to reduce evaporation losses, being brought to operating temperature each morning in two hours.

The pickling solution is 9 to 11 per cent nitric acid and 4 to 6 per cent hydrofluoric acid. A fluid level of 20 inches is held in the tank, requiring 2 to 4 inches of make-up chemical and water to be added daily. The tank was in intermittent service from July, 1946 to February, 1947, and has been in continuous service since then. No wear or deterioration of the carbon brick or the impervious graphite heaters has been noted.

At the start of the operation Pacific Tube encountered considerable difficulty with wooden liners installed on the bottom and sides to hold the bales of tube off the floor of the tank and to protect the heaters along the sides from damage. Douglas fir beams started to shred within two days and were completely disintegrated in a week.

This trouble was overcome by substituting 4 x 8-inch graphite beams vertically between the plate heaters and horizontally on the floor. In order to prevent marking of the pipe with graphite that might rub off from the bottom beams, 3 inch wide strips of flat stainless steel were placed lengthwise on top of these floor liners. The tubing rests upon this metal. Since their installation there has been no wear or deterioration of the graphite beams, and adequate circulation of pickling fluid beneath the bales of tubing has been assured.

Further evidence of the ability of impervious graphite to stand up against nitric acid is observed in the passivating tank at Pacific Tube. This tank is built with acid-resistant ceramic brick over the Koroseal membrane, but like the pickling tank is heated with Karbate graphite exchangers. A straight 20 per cent nitric acid solution has been in the tank since July, 1946 and has had no detrimental effect upon the exchangers. The operating temperature is 140° F.

Most severe service conditions are encountered at the Waldrip Engineering Co. plant. Here a solution of 3 to 6½ per cent total fluorides as hydrofluoric acid and 23 to 24 per cent nitric acid is used at 140-160° F—the high percentage of nitric acid being employed to combine both the pickling and the passivating actions in the same tank at the same time. Depending upon the heat treatment that the metal received before immersion, the pickling-passivating cycle requires 30 minutes to 4 hours.

A wooden tank 36 x 10 x 5 feet was first erected for this service, but rapid deterioration of the wood necessitated a change to the present 20 x 8 x 6-feet deep carbon lined structure. This tank is built with an outside wall "gunited" to one foot in thickness, painted inside and out with pitch, and further painted on the inside with a sulphur-base acid resistant coating. Two courses of carbon brick are laid inside and the cracks between them sealed with Carbo-Vitrobond cement. The two courses over the floor are laid on edge, giving a 9-inch depth of brick: the side walls have one course laid vertically to the other, giving an 11¼-inch width of carbon.

Heat is supplied through stainless steel steam coils, but erosion is severe and maintenance so troublesome that they are now considering installation of Karbate plate heaters similar to those at the Norris Stamping and Pacific Tube plants.

The tank has been in use since July, 1944 and shows no evidence of wear or deterioration of the brick.

While the simultaneous pickling and passivation of stainless steels may be a compartively new practice, Waldrip engineers say there is no case on their records of a complaint that corrosion followed passivation.

The main problem in the new strong nitric-hydrofluoric acid pickling installations has been to secure satisfactory materials of construction; this apparently has been solved.

—o—

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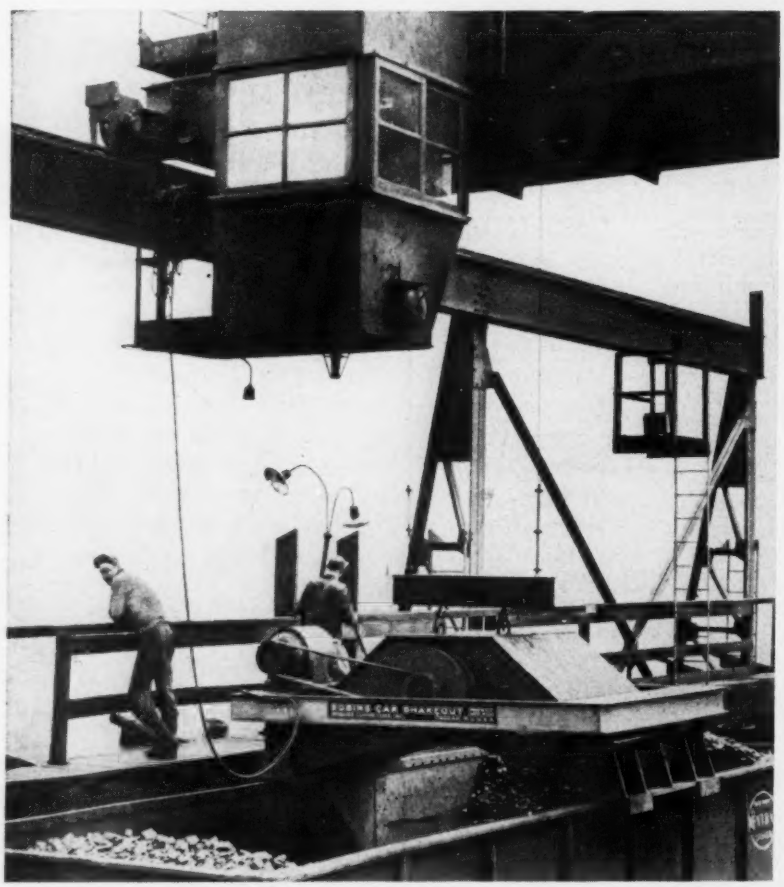

"BIG SHAKE": Bearing this name given it by coal car unloading workers, this car shakeout made by Robins Conveyors Inc., Passaic, N. J., sets up seismic action when in operation to make coal flow out of the bottom of the car. Average time required to empty a 50-ton car is about 2 minutes, this being attained with little worker exertion and with no damage to the car. Shakeout is lowered to top of car by a crane and a button pressed to set it in operation

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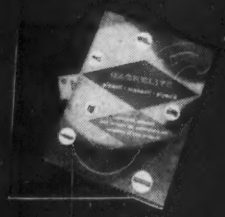

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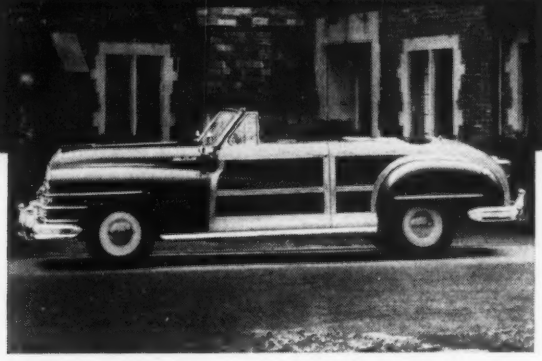

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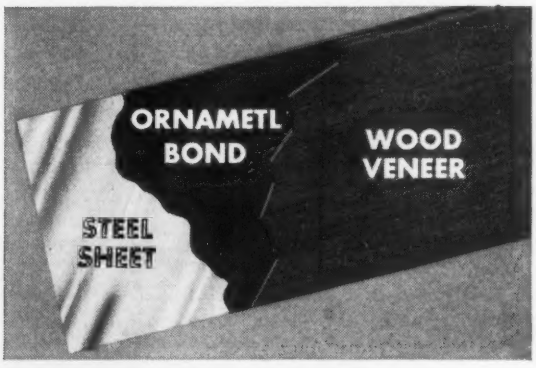

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ADVANCES IN METAL FINISHING

—Described at Electroplaters' Meeting

Fig. 1 — Spiral contractometer developed for measuring stress in electrodeposited nickel coatings

New instrument for measuring stress in electrodeposits, methods for oxidation of trivalent chromium, metals of the future, and plating metal on plastics serve as subjects for some of technical papers presented

RECENT developments in plating and testing of electroplated coatings as well as advances in electropolishing and rustproofing formed the basis for technical papers presented at the 35th annual convention of American Electroplaters' Society held at Atlantic City, N. J., June 28 to July 1. Another feature of the meeting was the Industrial Finishing Exposition where latest developments in equipment, materials, services and processes for industrial finishing operations were exhibited.

A digest of some of the papers presented at the meeting follows:

Industrial Electroplating — Practicability of industrial electropolishing has been demonstrated in the last two years, stated Charles L. Faust and E. E. Graves, Battelle Memorial Institute, Columbus, O., in a paper which discussed factors which determine advantages and limitations of electropolishing. Attractive appearance is attained with significant cost savings using this method.

Total for all costs directly chargeable against the electropolishing operation range from 5.3 to 25 cents per square foot of surface processed. For electrodepositing bright nickel plate, costs for the unit operation were stated to be in the range of 5 to 25 cents per square foot per 0.001-inch of nickel applied.

Methods are available for industrially electropolishing austenitic, ferritic and martensitic stainless steels, low and high carbon and low alloy steels, nickel, Monel, nickel silver, brass, copper, silver, pure zinc, Inconel, chromel and nichrome. Wrought and electrodeposited metals

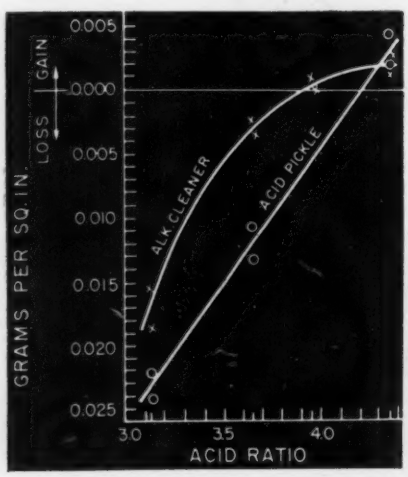


Fig. 2—Change in weight of metal when treated in phosphate solutions of varying acid ratio

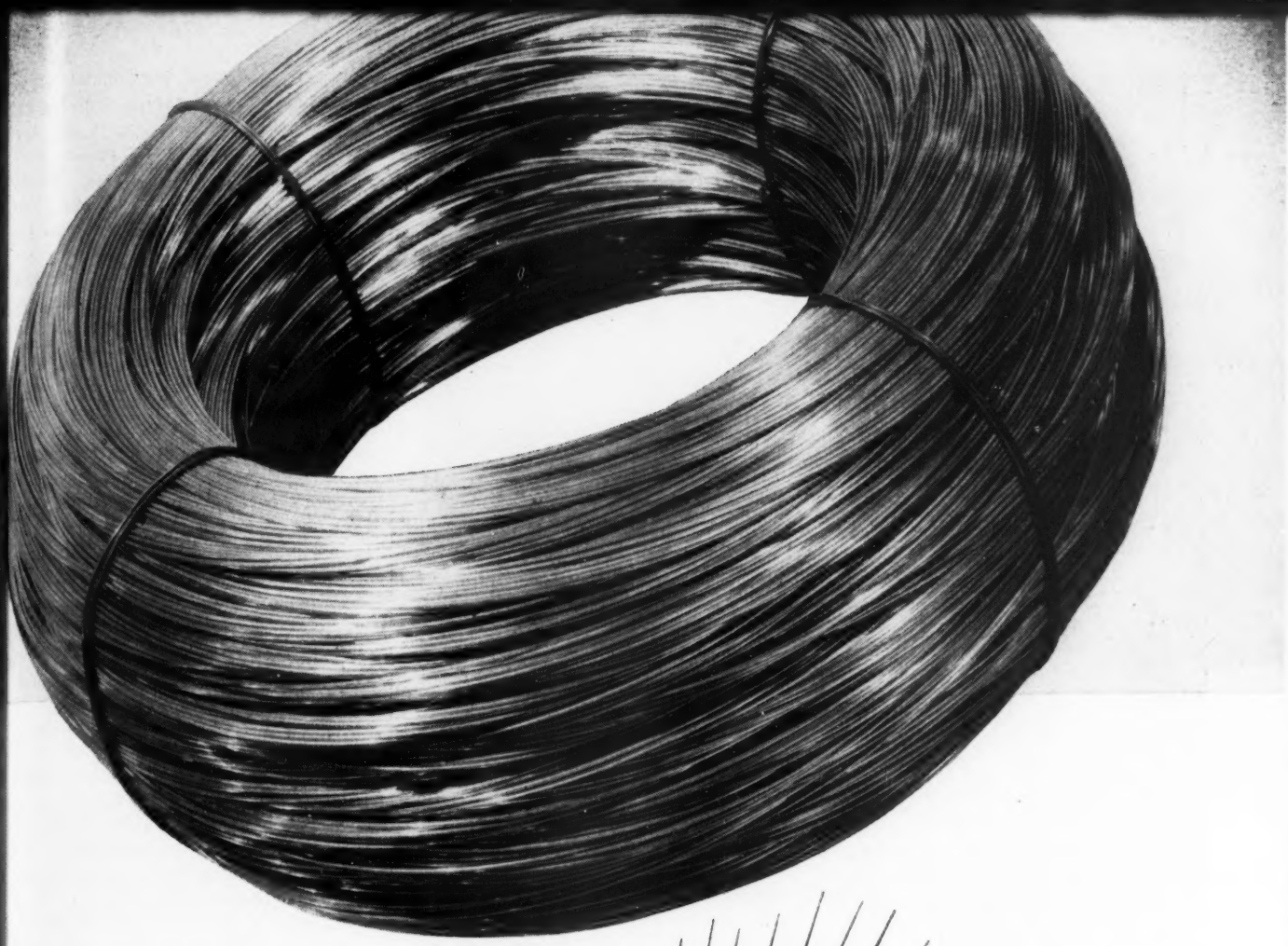
are most suitable and castings are borderline as to electropolishability. For die castings, a good commercial method is needed, the authors pointed out.

Excellent appearance is most generally obtained with material having a grain size of 9 (American Society for Testing Materials standard), whereas only fair to good results are obtained where grain size is 7 to 8 and results are usually poor when grain size is 6.

Measurement of Stress in Nickel Deposits—Present day interest in the physical properties of electrodeposits and methods for measuring them was reflected in a paper, based on work carried out at the National Bureau of Standards, Washington, and presented by Dr. Abner Brenner and Seymour Senderoff, which described the spiral contractometer, developed for the measurement of stress in electrodeposits. In recent years there has been a growing interest in the relationship of internal stress to the performance of electrodeposited coatings.

Highly stressed deposits are subject to peeling, cracking, blistering and the somewhat complex phenomenon of stress corrosion. In order to study and control the stress in electroplates, a suitable means of measuring this property is required. This measurement has been performed by measuring the deflection of a straight strip which has been plated on one side. Since the various ways of doing this, according to Brenner and Senderoff, have been either cumbersome or unreliable, a new instrument called the spiral contractometer, Fig. 1, was developed at the National Bureau of Standards. It is based on a helix rather than a straight strip. When the helix is plated on the outside it either coils up or uncoils, depending upon the direction of the stress; and the amount of coiling is read on a dial on the instrument.

Validity of measurements using this new instrument was demonstrated by comparing the values of stress obtained with the spiral contractometer with those obtained by measuring stress by different principles, and by a straight strip contractometer. Agreement was good in all cases. In simultaneous measurements in the same solution made with the spiral and strip contractometers, deviation



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between the two instruments was less than plus or minus 3 per cent.

In earlier measurements of the stress of nickel deposits by the contractometer method, it was found that the stress decreased with increasing thickness of the deposit. Investigation revealed that the decrease in stress with thickness is real, and that it is associated with the increase of grain size of the nickel deposit as its thickness increases.

Oxidation of Trivalent Chromium—Methods for oxidation of the trivalent chromium which accumulated in certain types of chromium plating operations were presented in a paper based on work carried out at National Bureau of Standards by Robert Seemiller and Vernon Lamb. Chromium plating is usually applied to articles that permit the use of a relatively large ratio of the anode to cathode area. Under these conditions the concentration of trivalent chromium is relatively low when equilibrium is established between (a) reduction of hexavalent to trivalent chromium at the cathode, and (b) oxidation of trivalent chromium at the anode.

However, plating on the inside of tubes or cylinders necessarily involves a smaller area of the anode than of the cathode. Under these conditions the concentration of trivalent chromium in the bath may become very high and its control may become important. According to Seemiller and Lamb, tests of previous methods gave erratic and unsatisfactory results. A study was, therefore, undertaken to determine optimum conditions for re-oxidizing trivalent chromium electrolytically. Toward this end the effect of several variables on efficiency of oxidation at the anode, and efficiency of reduction of hexavalent to trivalent chromium at the cathode were studied.

Variables investigated included sulphate concentration, current density, temperature, chromic acid concentration, trivalent chromium concentration and electrode material. From a practical standpoint, a high temperature was found to be the most important factor favoring conversion of trivalent to hexavalent chromium. Thus by using a low anode current density 2 amperes per square decimeter and a high cathode current density 60 amperes per square decimeter at 80° C (176° F), the net oxidation efficiency in a cell without a diaphragm was 92 per cent, while under similar conditions at 50° C (122° F) the net oxidation efficiency was 50 per cent, and at 20° C (68° F) it was only 15 per cent. This increase in net efficiency at the higher temperatures is shown to be main-

ly the result of decreased reduction efficiency at the cathode of high temperatures.

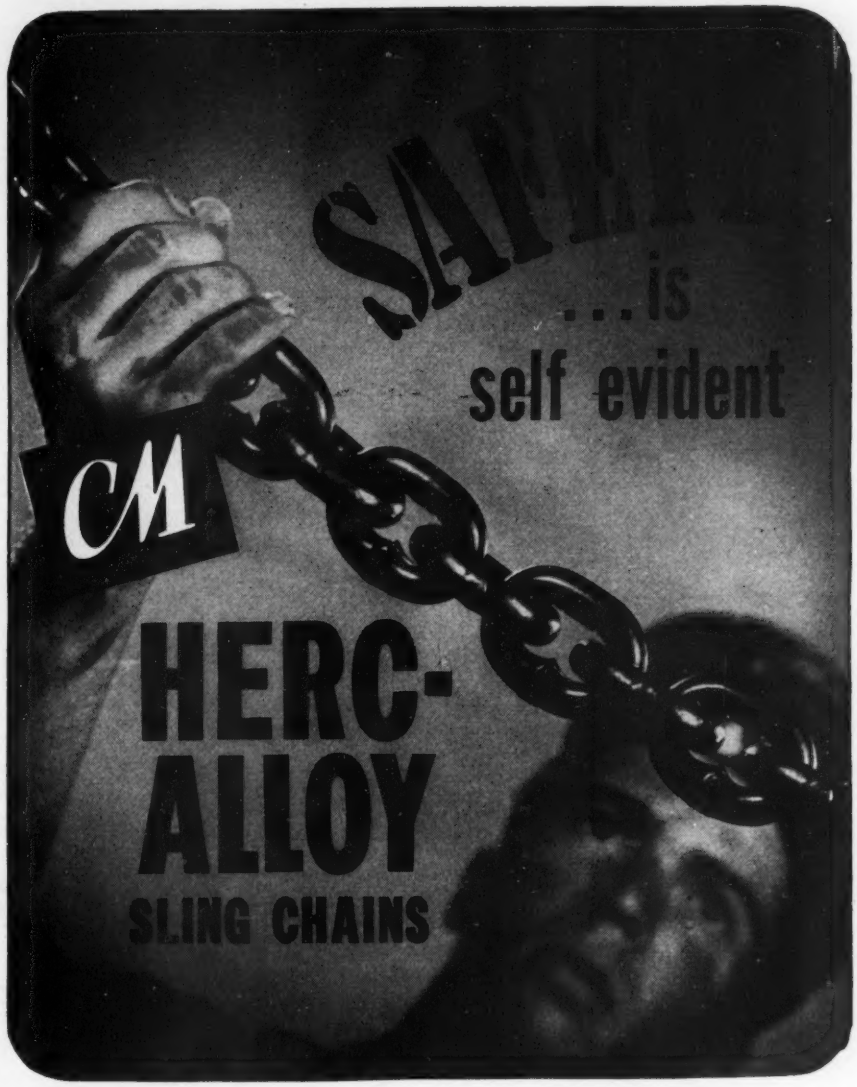
Metals of the Future—In discussing electroplaters' metals of the future, Dr. Fredrick A. Lowenheim, Metal and Thermit Corp., New York, brought out the fact that the plating industry is today engaged in laying down on various base metals coatings of just sixteen metals, singly or in combination. These sixteen are chromium, iron, cobalt, nickel, copper, zinc, rhodium, palladium, silver, cadmium, indium, tin, iridium, platinum, gold and lead. There are 73 known metals, if arsenic, selenium, and tellurium are included, leaving 57 metals in which the electroplater has, at present, no direct interest as coating materials.

He pointed out that because a metal is expensive it does not necessarily mean that there is no hope of using it. Even the very costly metals have their specialized uses. There is also the strong possibility, in the case of several of the so-called rare metals, that the price can be lowered several fold, if and when, good large-scale uses are found.

According to Dr. Lowenheim, of all "uncommon" metals, tungsten has probably received the most attention; however, it remains doubtful whether pure tungsten has been deposited from water solution, whereas, there is no doubt that alloys of tungsten with other metals have been plated. Principal interest indicated in the most recent work in tungsten alloy plating is in the tungsten-cobalt alloys; this interest stems from their hardness, especially hot. These alloys are related to Stellite, except that they contain no chromium. Recent work carried out at the National Bureau of Standards has shown that certain electrodeposited tungsten-cobalt alloys approach Stellite in hot-hardness.

Strip Plating Cell—R. A. Dimon, Carnegie-Illinois Steel Corp., Pittsburgh, described a "Circulating Cell" which is designed for laboratory use to duplicate as closely as possible the conditions present in passing strip steel through a tank at a given speed by pumping electrolyte past the test strip at the same speed. Means of measuring and controlling the solution flow, as well as other factors which influence plating, such as electrolyte temperature, plating current and plating time are also provided in the laboratory cell.

It was pointed out by Mr. Dimon, that obtaining a melted coating with a high luster is a severe criterion of the conditions employed during electrodeposition; therefore, it is important that proper equipment be



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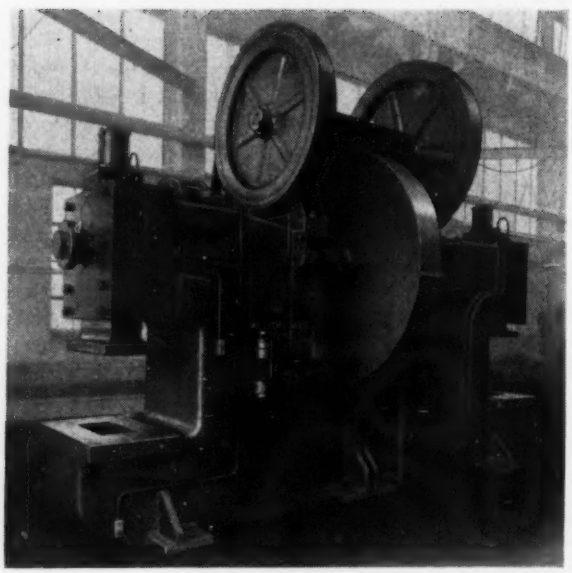

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provided so the coatings coming from the circulating experimental cell be melted and quenched in a manner similar to that utilized on the commercial units.

Plating on Plastics — Paralleling the progress made in the plastics industry during the past decade, it was pointed out by Harold Narcus, president and technical director, Electrochemical Industries, Inc., Leominster, Mass., that there has been a constant development of more efficient and economical methods for the electrodeposition of metallic coating on these inert resinous materials. He described a method for plating on plastics by the formation of copper films by chemical reduction on the plastic surface, prior to electroplating.

The preferred mechanical depolishing procedure is usually accomplished by wet-tumbling the plastic parts in a mixture of 100-110 mesh pumice and water for several hours, depending upon the shape, size and condition of the surface, or by blasting with 220 grain aluminum oxide. Following this roughening or "deglazing" treatment, it is important that suitable cleaning be carried out to free the surface of the plastic from any greasy or oily films, or other surface contaminant. It was pointed out by Mr. Narcus, that the cleaners employed need not be strongly alkaline. Mild proprietory cleaners, commonly used for soak cleaning of nonferrous metals, are generally satisfactory when used at a temperature in the general range of 90-110° F.

Sensitizing treatment is carried out immediately after the cleaning by immersing the plastic part for one to two minutes in a solution consisting of 50 cubic centimeters concentrated titanous chloride ($TiCl_3$) and 50 cubic centimeters concentrated hydrochloric acid in one liter of water. The activating or "seeding" treatment is exercised by immersing the plastic part, after its "sensitization", in an extremely dilute solution of chloroplatinic acid. ($H_2PtCl_6.6H_2O$). A concentration of one gram of chloroplatinic acid per gallon of distilled water suffices, with a treatment time ranging from five to ten minutes.

Following the above pretreatments, the plastic part is ready to receive the reduced copper film. This film is produced by reduction of Fehling's solution, employing a 20 per cent (by weight) solution of a metallic sulphoxalate formaldehyde. In the case of plastic items which lend themselves to processing in bulk, the formation of the reduced copper film is performed in inclined or horizontal

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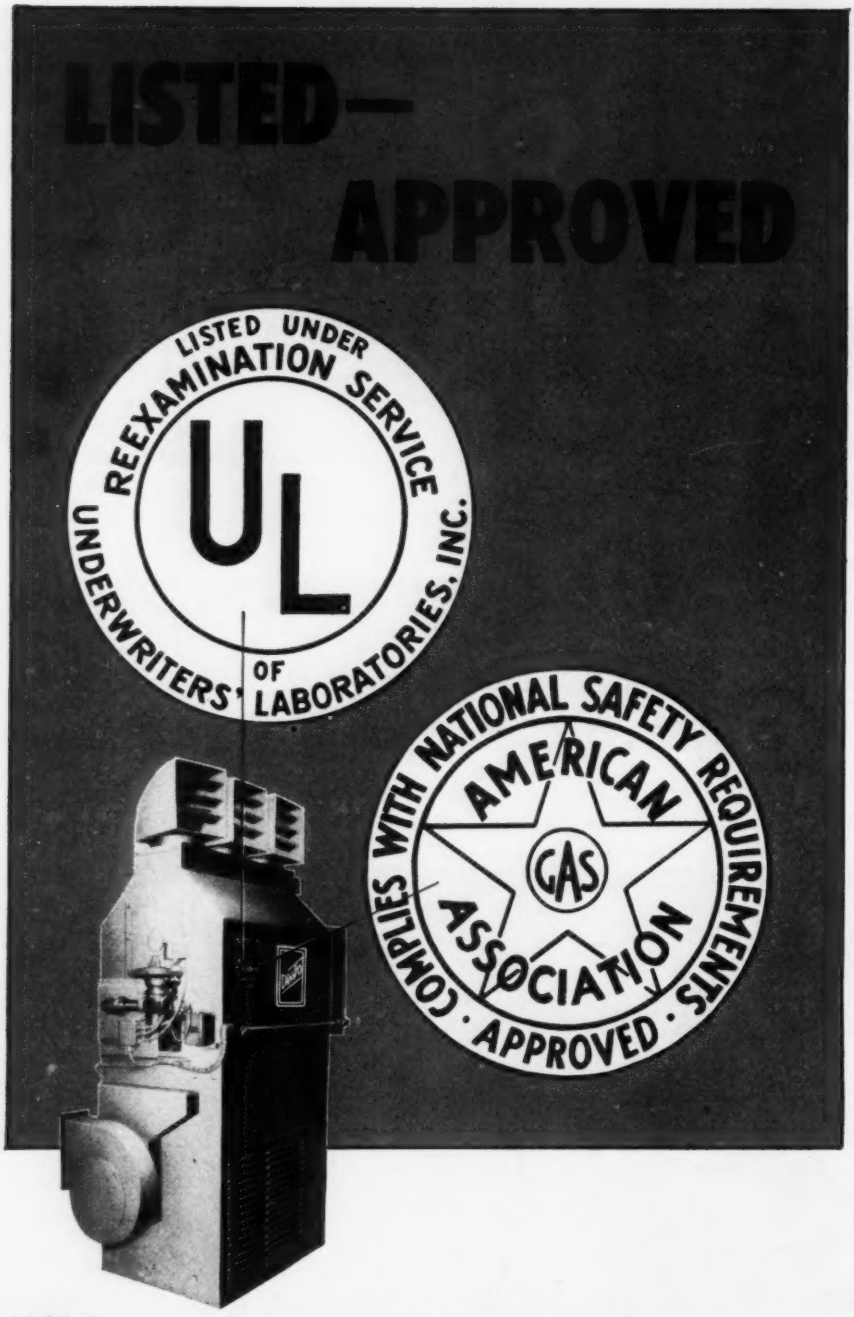

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After formation of the copper film upon the plastic surface, it is thoroughly rinsed in water and dried. The parts are then copper or silver plated; copper plating is generally preferred from the economic standpoint, and a thickness of 0.003 inch was recommended by Narcus, as deposited from an electrolyte containing less free sulphuric acid than is used in conventional acid copper plating baths. The outer layer of metal can be any metal which can be electrodeposited from presently used electrolytes. It is applied after the acid copper, which has been deposited as described, is bright-dipped, tumbled or hand polished to the desired lustre.

Phosphate Coating of Steel—One of the methods used to inhibit the corrosion of exposed steel surfaces is the treatment with phosphate solutions, thereby forming a surface which will bond organic and paint coatings more firmly to the underlying metal. In discussing the factors which affect the time and quality of the phosphate coating produced on steel articles, Nelson F. Murphy, Virginia Polytechnic Institute, and Michael A. Streicher, formerly of Syracuse University, brought out experimental results which indicated the importance of acid ratio in phosphatization of steel.

The "acid ratio" in phosphate coating baths was defined as the ratio of the concentration of "total acid" present to "free acid". The "total acid" is found by titration of a sample of solution with 0.1 normal sodium hydroxide using phenolphthalein as an indicator. (End point pH 8.6) The "free acid" is found by titration of the same size sample with the same solution of sodium hydroxide using bromphenol blue as an indicator. (End point pH 4.4) Thus, the phenolphthalein titration divided by the bromphenol blue titration is the acid ratio. The acid ratio is a sensitive indicator of the acidity of the bath in relation to the total chemical concentration. A low acid ratio indicates a more acid solution, and a high ratio, a less acid solution.

If the ratio of total to free acid is too low, the treatment time is too long and the protective value of the coating is reduced owing to the decrease in the tertiary phosphates in the coat. If the free acid content is too low, precipitation of insoluble phosphates will occur throughout the solution. If the absolute concentration of the bath is too low, the pH of the bath increases so rapidly in operation that precipitation of insoluble phosphates occurs. If the absolute

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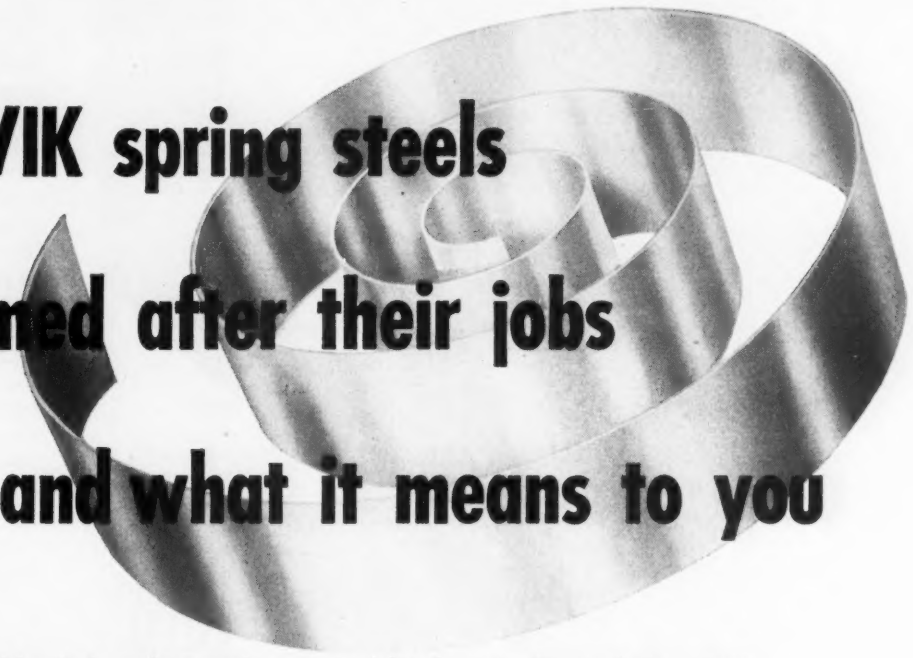

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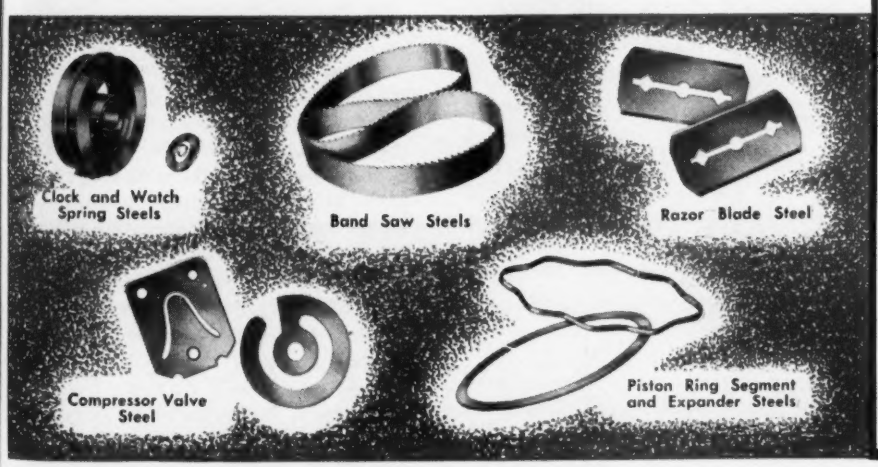
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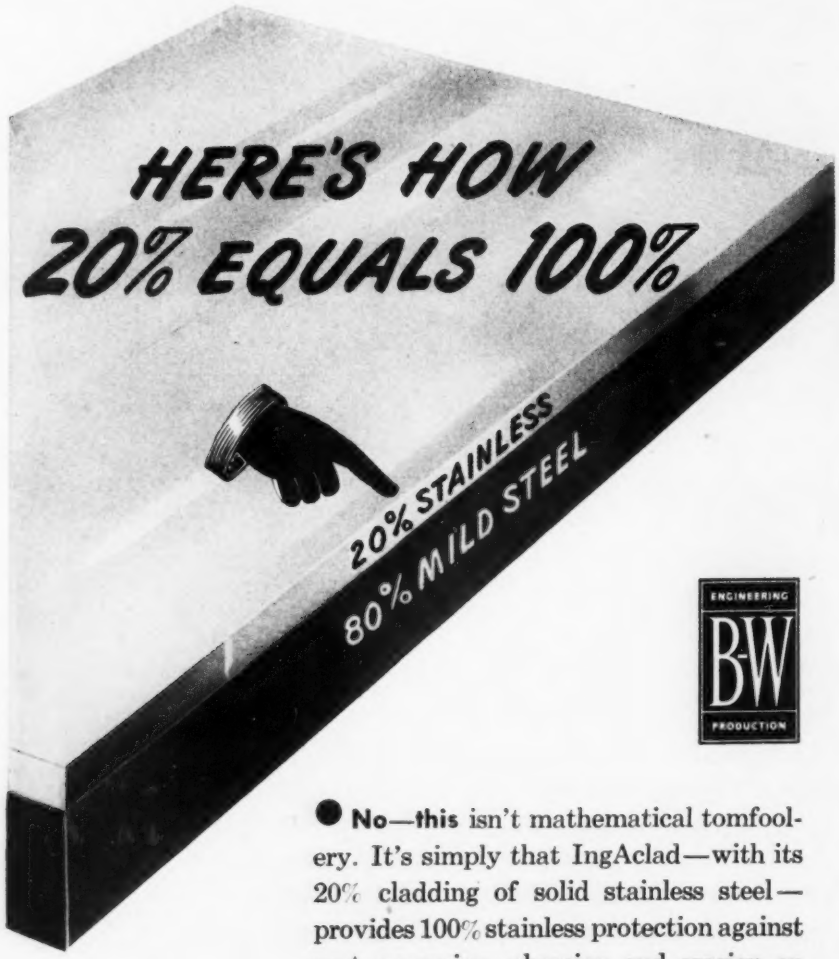

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concentration is too high, the pH is not increased rapidly enough at the interface and treatment time is too long.

In a bath having a low acid ratio, profuse hydrogen bubbling takes place and the coats produced will be coarse, giving low corrosion resistance. A phosphate coating bath having a high acid ratio was described as a slow bath with a tendency towards excessive sludge formation.

A series of tests were made by Murphy and Streicher to determine some of the factors controlling weight changes during phosphate coating processes. Some of the conclusions drawn from this work, which are of interest to the metalworking industry, are given below:

1. Objects may gain or lose weight during phosphatization.

2. In general, acid pickling before phosphate treatment accentuates the loss or gain in weight, i.e., a pickled object will gain or lose more weight than an article which has been alkali cleaned and treated in the same phosphate bath.

3. A phosphate bath having an acid ratio of 3.8 to 4.0 or less will cause articles to lose weight. If the ratio is above this value, the articles will gain weight regardless of cleaning procedure. The turning point depends on the composition and treatment of the metal being phosphatized.

4. Whether an object will gain or lose weight depends on the acid ratio. The amount of gain or loss in weight depends on the acid ratio and the cleaning process, as is shown in Fig. 2.

Diaphragm Tanks for Cyanide Copper Plating—A paper prepared by R. H. McCahan and C. E. MacKinnon, E. I. du Pont de Nemours and Company, Niagara Falls, N. Y., described a new method for eliminating roughness in cyanide copper electroplating operations. The practical application of the method consists of separating the tank into anode and cathode compartments by means of a relatively heavy canvas diaphragm, and continuously pumping the electrolyte from anode to cathode compartment through a high-efficiency filter. For best operation of the system, the installation should be relatively leakproof, and efficient filtration from anode to cathode compartments should be provided. It was also recommended that there be no exposed metal other than the cathode in the cathode compartment.

Engineering Planning in the Plating Department—S. M. Martin, chief engineer, United Chromium, Inc., in discussing engineering of the plating department emphasized the import-

ance of considering carefully, all the details that go into the planning of a plating plant. Those doing the planning must have specific knowledge of the job to be done and knowledge of the equipment used. In addition, production requirements must be known, not only as to quantity, size and type, but also as to variety of work, variety of deposits and plate specification to be met.

It was brought out by Martin, that the layout study is an important phase of the engineering job. A poor layout is not only a mistake, but once installed is one of the most difficult and costly things to remedy. Important operations and facilities to be provided for in the overall layout, in addition to the tank and electrical equipment proper, are polishing and buffing, pre-cleaning, racking and unracking, inspection, laboratory control and stripping. With present day high speed and bright plating solutions the need for solution treatment is very important, and this means special storage and treatment tanks, with necessary pumping, filtering and piping equipment.

Silicone Production Begun in New Plant

Full capacity output of silicone materials has begun in General Electric Co.'s recently completed chemical plant located in Waterford, N. Y. Consisting of six buildings and a chemical tank farm, the plant will process products in the form of rubber, oils, greases, resins and water repellants.

Silicone rubber is being applied primarily as gaskets for a host of industrial products such as capacitors, jet and turbine engines, baking ovens, lighting fixtures and high vacuum systems. One of the principal uses for the oils is as a mold release agent in manufacture of rubber tires and also in aluminum and zinc die-casting.

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Technique for anodizing and coloring aluminum screws and rivets was announced recently by Technical Processes Division of Colonial Alloys Co., Philadelphia. The company reports it produces a protective coating that is hard, abrasion and corrosion resistant and cannot peel or craze. When combined with a chemical polishing process, rivets come out with a chromium like appearance for jobs where heads of rivets are decorative.

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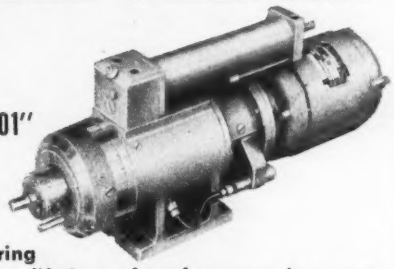

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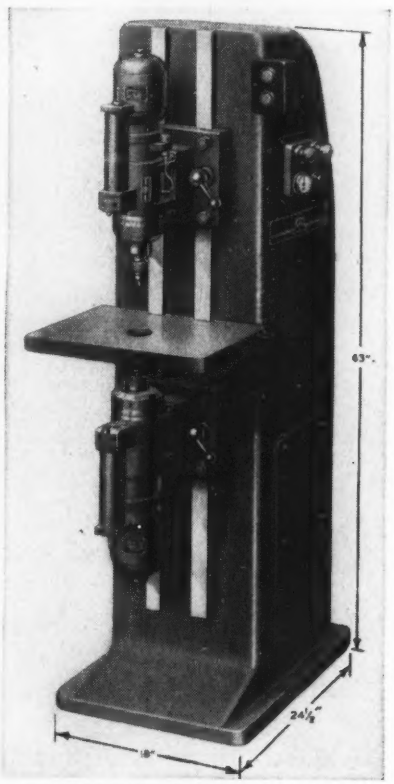

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Opens New English Lab

Announcement was made recently of the opening of British Iron & Steel Association laboratories at Sketty Hall, Swansea, South Wales, England. Coating problems will constitute about 75 per cent of the work, and the remainder will deal with steelmaking research. D. L. Phillips, formerly in charge of research work at Swansea University for the South Wales Siemens Steel Association, will head a staff of 26 persons at the new laboratories.

—o—

Outstanding in the fifth list of government owned inventions suitable for foreign patent filing is the magnetic clutch developed by National Bureau of Standards, Washington, (STEEL, April 19, page 96) according to a recent announcement of Office of Technical Services, Department of Commerce, Washington. The list contains 74 inventions including those in fields of machinery, instruments and minerals.

—o—

Traveling speeds almost double those of a crawler tractor can be attained with a rubber tired, 25-ton pusher and bulldozer now being manufactured at the Longview, Texas, plant of R. G. LeTourneau Inc. The 300 horsepower unit has an electrically-operated blade control which is powered with a 240 volt, 120 cycle alternating current motor working through a gear reduction box. Blade is locked in desired position upon release of the control switch by means of the motor brake which is an integral part of the motor assembly.

For Economy... Pittsburgh Alloy and Stainless Steel Wire

Production goes up—costs come down when you use Pittsburgh Alloy and Stainless Steel Wire in your manufacturing operations. It has the uniformity and accuracy to work easily in your machines—produce better wire products for you.

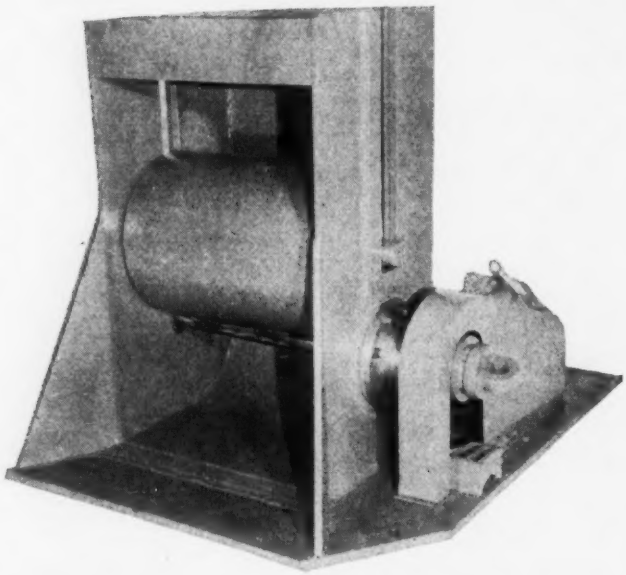
Pittsburgh Steel Company

3264 Grant Building, Pittsburgh 30, Pa.

JOHNSON STEEL & WIRE COMPANY, INC.

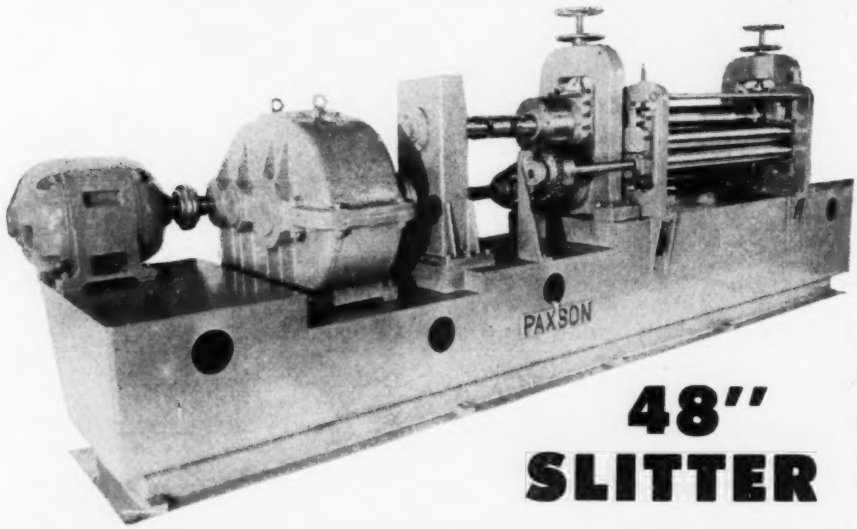
Worcester, Mass.

PAXSON



SCRAP BALLER

Here is a new design of an old tool. The steel scrap is fed into the machine and wound around a small driven arbor and at the same time is compressed by the floating roll. The bale of scrap, 18″ x 24″, then is removed by withdrawing the small arbor. The baler can be moved to any location in the plant where current is available and the design is such that the machine will not tip or slide on the floor. Motor, speed reducer and all electrical connections are included and delivery can be made in 60 to 90 days.



48″ SLITTER

The Paxson 48″ Slitter is designed for sheets and coils. Its maximum capacity is 11 cuts of 11 gage metal, 100′ per minute when slitting sheets and 100′-800′ per minute when slitting coils. The slitter is equipped with overriding clutches to allow free wheeling of the arbors when coils are being slit. Detachable pinch rolls are provided for use when slitting sheets.

We also manufacture coilers, levellers, pay off reels, edge rollers and the 84″ Paxson slitter built for special requirements.

Write for complete information on any of this equipment.

PAXSON MACHINE CO.
SALEM, OHIO

Index Published To Aid Location of Standards

Location of the 1500 standard specifications and tests contained in the 1946 book of standards and in the supplement issued in 1947 by American Society for Testing Materials, Philadelphia, is simplified with an index published recently. Index is also useful for determining whether the society has issued any information or specifications covering a particular enginering material or subject.

All items are listed in the index under appropriate key words according to the particular subjects they cover. In addition a list is given of the tests and specifications in numeric sequence of their serial designations.

Rights Acquired to Line of Electronic Equipment

Exclusive patent, manufacturing and sales rights to the line of Jack & Heintz electronic inspection equipment were acquired by Merz Engineering Co., Indianapolis. The line is being marketed under the designation of New-Tronic gages and sorting machines.

Comparators in four models are being manufactured for external measurements and are equipped with two magnification scales. A height gage and ball sorting machines complete the line.

—o—

An improved diesel D8 track type tractor, featuring 130 drawbar horsepower and constant mesh transmission is now being produced by Caterpillar Tractor Co., Peoria, Ill. Operations of the unit are speeded up appreciably by the constant mesh transmission which permits shifting on the move the company reports. A conventional shift lever is provided for speed selection and a reverse lever is used for reversing travel direction in the first three speeds.

—o—

Copper ore from deep in the mines of upper Michigan, through its fabrication as seamless, nonferrous tubing and on to typical end applications is the subject of a 16 mm sound movie produced by Wolverine Tube Division of Calumet and Hecla Consolidated Copper Co. Inc., Detroit. Professional, engineering and business groups can arrange for showings by contacting the company.

Weatherizing Compound Protects Gas Holders

Water repellent, weather resistant compound called "Dum Dum for Metal" which was developed by Arco Co., Cleveland, has been used by Pacific Gas & Electric Co., to recondition two gas holders at Fresno, Calif. Prior to its application this compound was subjected to a series of exposure tests dating back to 1942. These tests provided for immersion of coated steel panels to half their length in two tanks, one containing sea water and the other fresh water. Upon removal from the baths, recently, inspection showed that protective skin of the panels remained unbroken, preventing corrosion from getting a start.

New mastic type weatherizing compound is well suited for pressure spray application. Where bad surface conditions prevail, cleaning and priming are required prior to application. Surface conditioning consists of two steps: Wire brushing for rust and scale removal and solvent or alkaline cleaning to rid the surface of oil, grease and dirt.

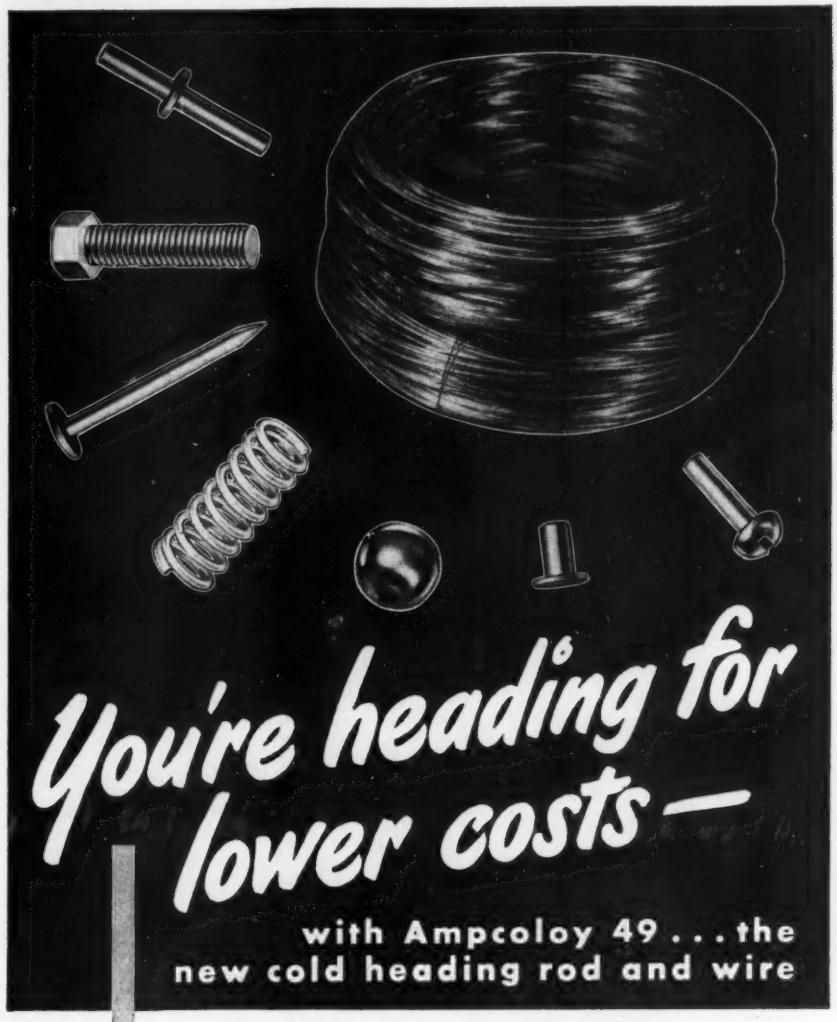
Standardized Broaches Fit Variety of Jobs

Standard tools for broaching keyways, have been developed by Zagar Tool Inc., Cleveland, and are designed to be used on short stroke machines in plants producing many sizes of holes with different sizes of keyways. Broaches have been standardized so that it is possible to make keyways ½ x ¼ x 4 inches on 20 inch stroke machines and keyways up to x ½ x 6 inches on 36 inch stroke machines.

Standardizing of keyway broaching horns by a system of interchangeable parts has eliminated the need for separate adaptors for each diameter of hole and each size of keyway. Combining of three separate parts makes it possible to reduce tool inventories.

—o—

In contrast to the conventional tensile testers which determine tensile stress, a new device developed at National Bureau of Standards, Washington, conveniently measures strain in vulcanized rubber. In this apparatus the strain is measured at a definite time after application of a predetermined stress. Its development followed investigations which revealed that the new technique combines a higher degree of reproducibility in measurement with an accuracy not previously possible.



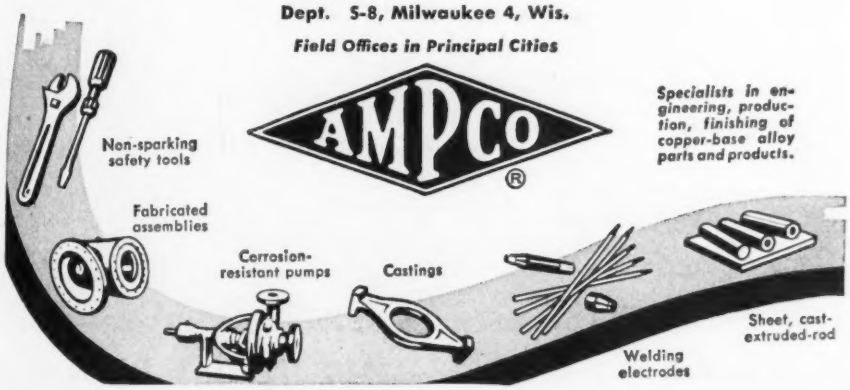
. . . . This new aluminum bronze alloy combines ductility for cold heading and high strength-weight ratio for economy

HERE'S the first real answer to your demand for an aluminum bronze suitable for cold heading — Ampcoloy 49. It is alloyed specifically to provide the ductility that cold heading requires. Light in weight and strong, as are all aluminum bronzes, Ampcoloy 49 is still further improved by cold working.

You can get Ampcoloy 49 as extruded solid rod in diameters up to 3", or in 100-pound coils of cold-heading wire, sizes from .125 to .420 gauge.

Use Ampcoloy 49 for economical cold-heading production of bolts, rivets, screws, and similar fastenings. Take advantage of its excellent spring characteristics, its corrosion resistance, and its weldability. It can be cold-coined, cold-forged — and annealed, if it is desirable to change its physical properties. And in every application, you have the advantage of the clean, sound grain structure and close tolerances delivered by the extrusion process. For complete information on Ampcoloy 49, write for Bulletin 88.

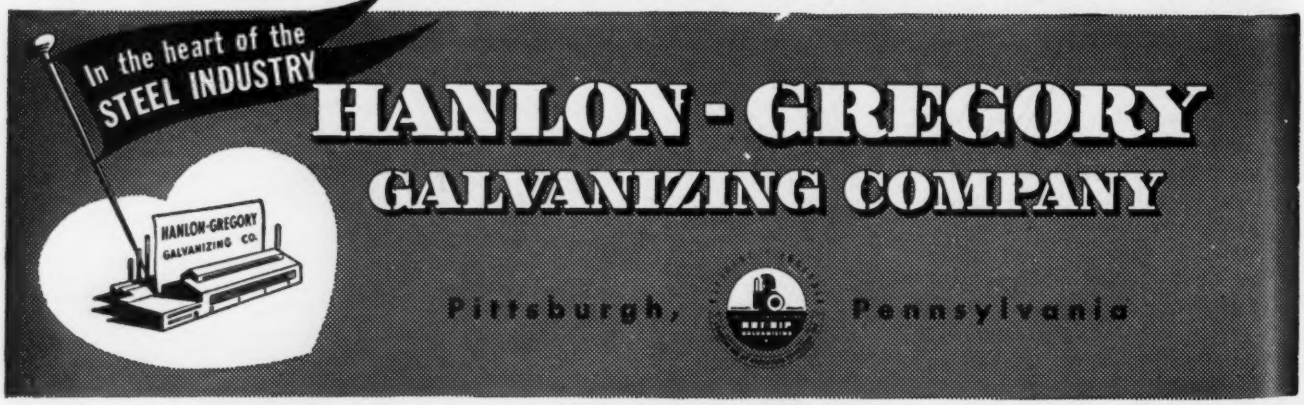
Ampco Metal, Inc.
Dept. S-8, Milwaukee 4, Wis.
Field Offices in Principal Cities



Hot-Dip Galvanized Derricks *Last Longest*

Light structural steel for permanent or portable installations—protected against the elements with the best possible coating of zinc by the Hanlon-Gregory method of Hot-Dip Galvanizing—*will* prevent rust, render greater uninterrupted service and eliminate maintenance costs. The world's largest Hot-Dip Galvanizing plant—located in the heart of the steel industry, is equipped to galvanize *your* metal products whatever they may be. There is capacity for quantities of any size from truckloads to carloads.

THE WORLD'S LARGEST JOB GALVANIZING PLANT

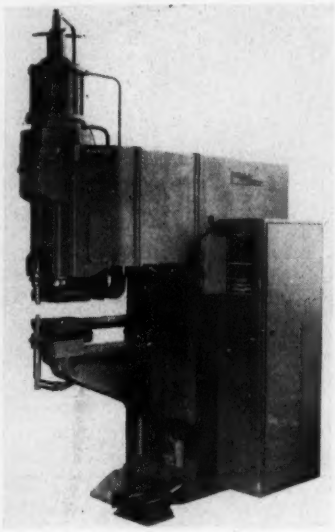


GALVANIZING . . . PICKLING . . . and OILING

New Products and Equipment

Three Phase Welder

Three-phase balanced power, supplied by the Tri-Phase resistance welder made by Taylor-Winfield Corp., Warren, O., gives a high power factor of 95 per cent with greatly reduced power demand. Such an installation makes possible more production of heavier welding with present power installations. Additional advantages are greater ease in obtaining and maintaining welding



schedules, reduced electrode wear and pickup, closer spot spacing and less sensitivity to work thickness.

This type of welding circuit permits a greater range of shapes and sizes to be welded, especially in deep throated welders. Welding currents are essentially constant when magnetic work or fixtures are moved into the work area. High quality welds can be produced in low carbon steel, stainless steel, aluminum and magnesium alloys, Monel, Inconel, brass alloys, etc.

Check No. 1 on Reply Card for more Details

Pneumatic Timer

Machine tools, conveyors, automatic processing equipment, etc., are possible applications of the new alternating current pneumatic timer, announced by Cutler-Hammer Inc., 320 North 12th St., Milwaukee 1, Wis. The timer, which measures 2¾ x 4⅞-inches, has a timing adjustment which is made from the front of the unit with a screwdriver.

Eight turns of the screw gives the entire timing range from 0.3 seconds to 3 minutes. Reset of the timer is practically instantaneous. It is available either with one or two timing steps, the latter eliminating the need of one timing delay. The two steps are independently adjustable over the entire range.

Check No. 2 on Reply Card for more Details

Axial Flow Compressors

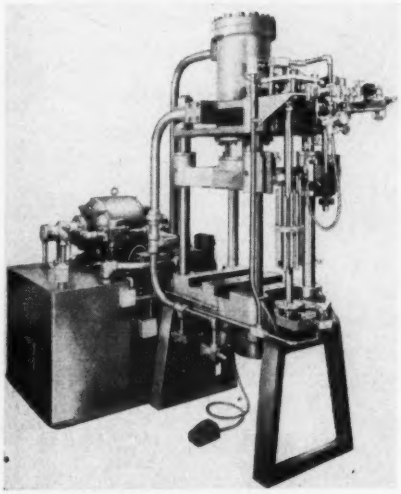
One model of the line of axial flow compressors introduced by Fredric Flader Inc., 595 Division St., North Tonawanda, N. Y., is only 22 inches long (between flanges) and has a case diameter of 17 inches, but is capable of delivering 18,000 cubic feet at 25-pound gage pressure. Operating efficiencies up to 88 per cent have been established. Larger sizes effect a savings of up to 20 per cent in power consumption.

Capacities range from 1000 to 300,000 cubic feet per minute and pressures up to 100 pounds per square inch can be obtained in a single unit. Compressor drive may be electrical, steam or gas turbine. Weight, floor area and general space requirements are considerably lessened.

Check No. 3 on Reply Card for more Details

Tube Bending Press

Any number of bending sequences up to the maximum of 12, with adjustable bending depth and automatic reset, are possible with the hydraulic tube bending press announced by Elmes Engineering Works of American Steel Foundries, 1002 Fulton St., Chicago 7, Ill. This, with a choice of four bending radii, gives a selection of any or all of 48 possible bending variations. Press capacity is 20 tons.

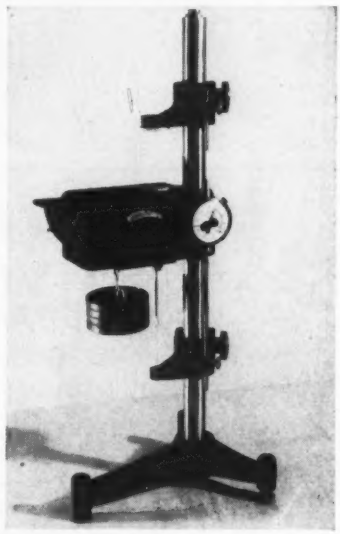


In line with each of the press' two cushions are two bending noses, each having a different radius. An indexing device controls the sequence and depth of bends. After sequence has been completed, the index automatically resets to starting position. Press cycle is controlled by a foot treadle. Uniformity of work is claimed at any production speed, because all bends are controlled mechanically.

Check No. 4 on Reply Card for more Details

Spring Load Tester

Higher speed and more accurate testing of coil springs is possible with the improved load tester, made by Hunter Pressed Steel Co., Lansdale, Pa., which will test 50 to 200 springs with an accuracy of one part



in 2500 at maximum load. Tester will handle loads of up to 5 pounds and springs up to 12 inches long. The model 217P is equally adapted to the go-no-go or the frequency distribution techniques of statistical inspection.

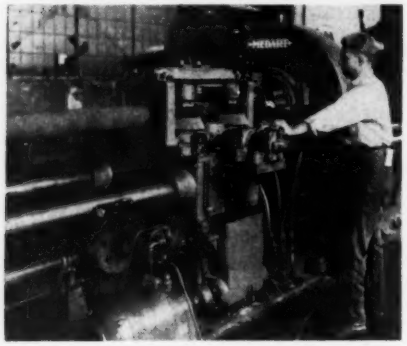
Operation is with a minimum of operator motions. To insure accuracy, the design eliminates errors chargeable to beam angle, beam-restoring forces and torsional effects. All compressionhead surfaces are replaceable and made of hardened steel which has been ground, lapped and chromium plated. An overload spring prevents damage from excess load or shock. The pointer mechanism, mounted in miniature ball bearings,

amplifies beam motion 10 times. Length measurements are recorded on a dial with a 1-inch range with 0.001-inch graduations.

Check No. 5 on Reply Card for more Details

Bar and Tube Turners

Three standard sizes for turning bars and tubes from 1 to 10 inches in diameter are included in the RFRG line of centerless bar and tube turners built by Medart Co., 100 Potomac St., St. Louis 18, Mo. Turners feature a roll type feed and an infinitely variable ratio of bar feed to cutting



tool speed. This feed gives a steady feed of the bar or tube through the cutters. An equalizing device which, centers the workpiece in the cutterhead is incorporated into the feed.

Separate drives are arranged for the cutting tools and the bar feed, so that an infinitely variable number of combinations are possible between these two to give close tolerance and better finish for precision turning or high production turning for a scalping operation. Runner-bar sections are arranged on both the input and output sides of the spindle with individual grip carriages on each.

Check No. 6 on Reply Card for more Details

Radiation Element

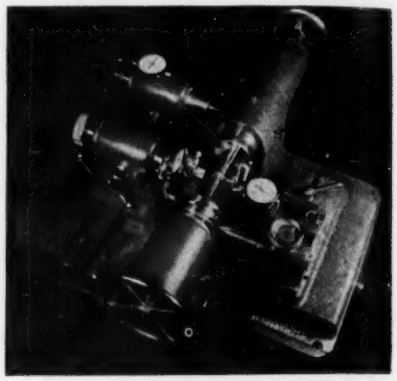
Designed for use on compressed air lines, the all cast directional-finned radiation element, a product of Wilson Engineering Corp., 122 South Michigan Ave., Chicago 3, Ill., is suited to a variety of other heat exchange purposes. Among its uses is that of compressed air radiation as an aftercooler to precipitate moisture out of air lines in stationary installations. Condensate recovery runs as high as 95 per cent. Water is drained off from reservoirs.

Other uses for the elements are in industrial unit heaters which require no louvers because of the directional fins, diesel locomotive deicing and drying machines, fuel oil heaters and engine radiators. Each section is tested for pressures to 500 pounds per square inch. Standard element measures 34¼ x 8⅜ x 5 inches.

Check No. 7 on Reply Card for more Details

Gear Checker

Smaller and more compact, a Red Ring universal gear checker, built by National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich.,



requires less floor space and is easier to move from one location to another

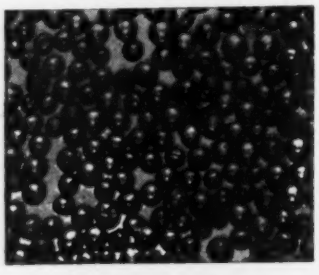
ACCEPTED
BY AMERICA'S LARGEST INDUSTRIAL PLANTS TO DO THE TOUGHEST BLASTING AND PEENING OPERATIONS

HI-GRADE METALLIC

FAMOUS
FOR ITS ABILITY TO STAND UP UNDER REPEATED HARD USE

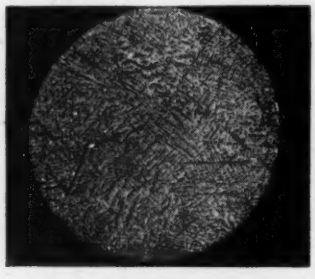
SHOT
- ROUND
- UNIFORM IN SIZE
- UNIFORM IN HARDNESS
- LACKS IRREGULAR SHAPES

GRIT
- RECTANGULAR
- SHARP
- TOUGH
- DURABLE



UNRETOUCHED PHOTO OF HI-GRADE SHOT

CLAYTON-SHERMAN ABRASIVES COMPANY
3896 LONYO ROAD
DETROIT 10, MICHIGAN
CEdar 7200



MICROSCOPIC STRUCTURE OF METAL

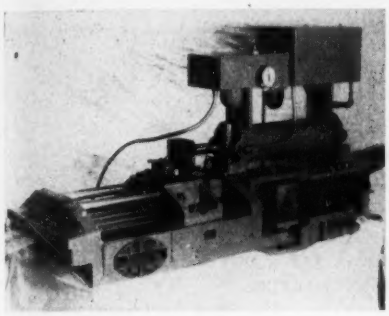
in the plant. It is offered with or without the base so that if it is desired the table which carries the checking heads may be used on a bench.

Gears up to 10 inches outside diameter may be checked. Machine checks lead, eccentricity and both tooth spacing and tooth parallelism. Overall dimensions are 18 inches wide and 29 inches long.

Check No. 8 on Reply Card for more Details

Press Slide Feed

A self-contained unit with no connections taken from the press, the air-operated slide feed, made by U. S. Tool Co. Inc., East Orange, N. J., can be used with all types of fabricating machines and can be moved from machine to machine. The air feed can



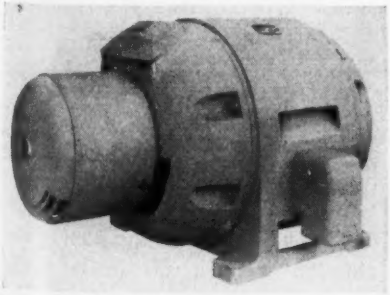
be used semiautomatically or can be made fully automatic by incorporating suitable interlocking switches.

Practically unlimited feed lengths can be obtained by making a multiple of strokes with feed timed to coincide with a stroke of the fabricating unit. Accuracy can be controlled to 0.002-inch at each stroke of the feed.

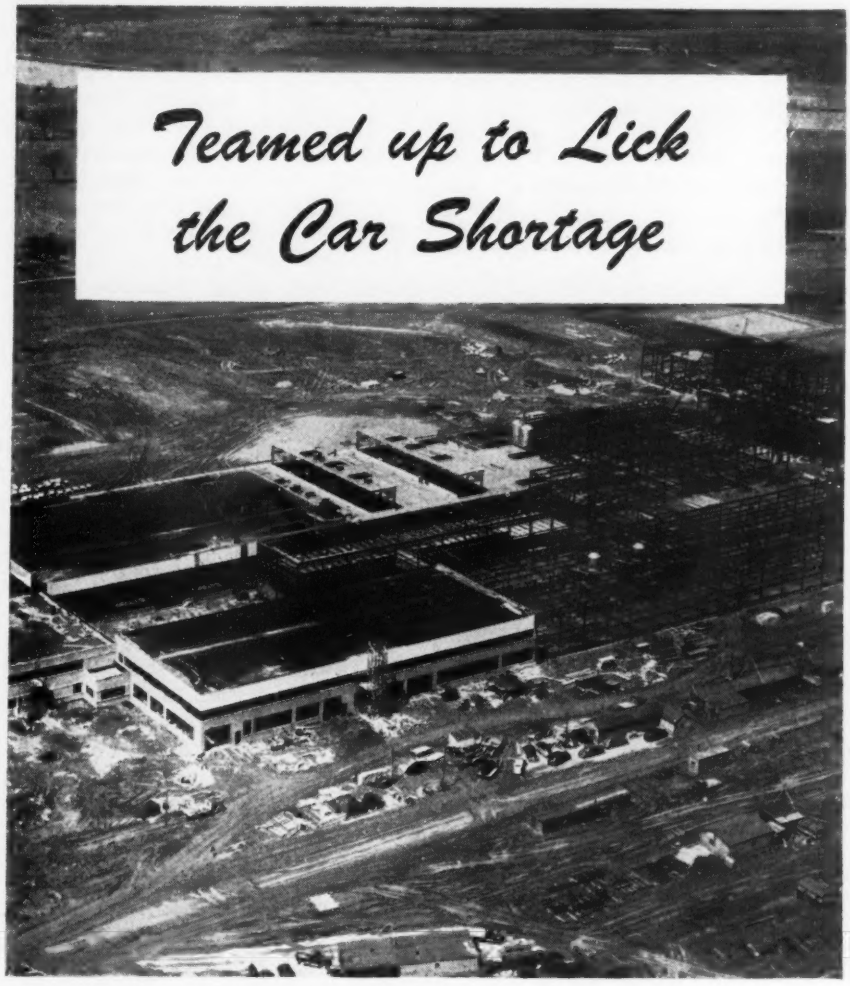
Check No. 9 on Reply Card for more Details

Motors, Generators

General Electric Co., Schenectady 5, N. Y., is offering a new line of general purpose Tri-Clad high speed synchronous motors and generators in 900 series frame sizes. Motors are made in standard ratings from 20



to 1000 horsepower at 60 cycle speeds of 514 to 1800 revolutions per minute,



"Structural steel by Ingalls . . . for a new automobile plant." Or it could be paper, or chemicals or foods, for Ingalls is teamed up with many widely divergent industries to fabricate steel for their new plants.

And for sound reasons: Ingalls steel always comes fabricated to exact specifications. Ingalls steel service is efficient, satisfactory. Our years of experience and advanced methods often save customers time, trouble, money.

Competent engineering and erecting facilities. Write, wire or telephone for quotations.

INGALLS

THE INGALLS IRON WORKS COMPANY

The Ingalls Shipbuilding Corporation, Birmingham Tank Company, The Steel Construction Company. EXECUTIVE OFFICE, BIRMINGHAM, ALA., New York Office, 1 E. 42nd St. Fabricating plants at Birmingham and North Birmingham, Ala., Verona, Pa., and Pascagoula, Miss.

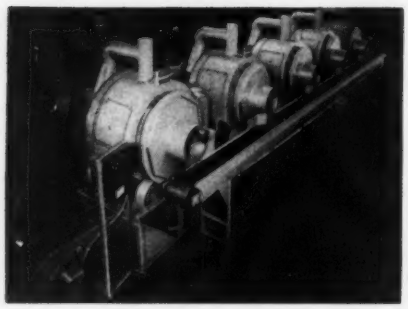
either in two or three-phase types. Generators are available in ratings from 12½ to 1250 kilovolt-amperes.

Of drip proof construction, the motors incorporate the usual Tri-Clad features. Direct-connected and belt driven exciters are available for all ratings.

Check No. 10 on Reply Card for more Details

Deburring Equipment

Use of sawdust in the automatic deburring equipment for bolts and nuts, designed by N. Ransohoff Inc., Cincinnati, O., does not remove all of the oil from the work, but leaves a thin film for rust protection. Conveyor, at the rear of the machine, loads the work into the tumbling barrel. A hopper at the conveyor's



lower end holds as many as five tote pans of work. A sweep, actuated by the machine operator, moves the work into the proper tumbling barrel of the series, providing there is more than one in the installation.

Tumbling barrels are equipped with timing switches which are manually set. The sawdust is continually sifted out from the work through grizzlies in the drum shell. It, along with pieces of metal flash, drops onto a conveyor, at the end of which is a magnetic separator for removing all metal particles. Rotation of barrel in the opposite direction empties it onto a conveyor.

Check No. 11 on Reply Card for more Details

Sand Rammers

Ramming costs may be reduced and more uniform molds produced with the line of sand rammers for all types of sand ramming in gray iron, steel, malleable, aluminum and magnesium foundries, manufactured by Rotor Tool Co., Cleveland, O. The light weight tools have hollow piston rods that are hard chromium plated, washer type valves and an air screen which protects working parts. Packing gland adjustment is from the outside and requires no wrenches. Automatic lubrication is built into the head.

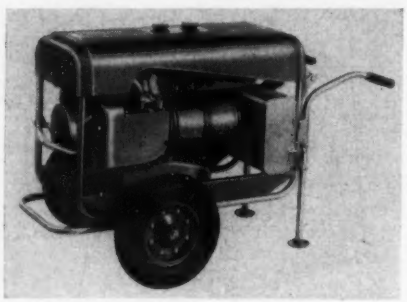
Selecting the right tool for the job is stressed, the company using the Dietert mold hardness tester for comparative purposes. Six models are made to cover the foundry field (model number is in parentheses): For light bench and core work, small flask (22B); for light ramming and deep flask (22F); for medium bench, mold work, in all foundries (44B); for light floor molding or bench molding with deep flask (44F); for heavy bench ramming in magnesium steel foundries (65B); for floor molding in all foundries, bench ramming with deep flask (65F).

Check No. 12 on Reply Card for more Details

Portable Welder

Welding jobs without any outside electrical supply can be performed with Sureweld direct current welding machine being manufactured by D. W. Onan & Sons Inc., Minneapolis 5, Minn. Total weight of the portable machine is 330 pounds. Power for the generator is supplied by a 10 horsepower, air cooled, 2-cylinder, 4 cycle engine.

Main current tap switch has eight settings ranging from 45 to 180 amperes, and the fine current control



gives operator complete latitude of control between main tap settings. A duplex receptacle permits direct plug-in of two extension lights whenever illumination is needed on the job.

Check No. 13 on Reply Card for more Details

• • •

DRILLING PLATE: Equipment necessary for drilling and reaming accurate holes is simplified by the universal drilling plate designed by Montgomery & Co., New York 7, N. Y. In setting up, clamps hold work securely against its side rails, then gage blocks and the master drill disk locate the position of the hole. Work need not be removed to drill.

Check No. 14 on Reply Card for more Details

FORK LIFT TRUCKS: Compact design, automatic progressive speed control to insure safety of load and extreme maneuverability are features of the new line of electric fork lift trucks announced by Wright-Hibbard Industrial Electric Truck Co., Phelps, N. Y. Included are trucks of 2000, 3000 and 4000-pound capacities.

Check No. 15 on Reply Card for more Details

AIR HOSE: Flexible as a lamp cord is the Highflex air hose for small tools, developed by B. F. Goodrich Co., Akron, O. Advantages are easier handling because of light weight, fewer kinks and easier use in close quarters. It is oilproof inside and out and will withstand pressure of 250 pounds per square inch. Hose weighs 8.8 pounds per 100 feet of the ¼-inch size.

Check No. 16 on Reply Card for more Details

SPRAY SYSTEM: J. J. Siefen Co., Detroit, Mich., is announcing equipment for the spraying of buffing and polishing compounds on revolving wheels. The air operated pressure pump furnishes compound to the spray guns, circulates it and returns it to the drum.

Check No. 17 on Reply Card for more Details

GREASE GUN FILLER: K-P Mfg. Co., Minneapolis 3, Minn., is producing a grease gun filling dispenser designed for use on the pail in which the grease is received. No removing of grease is required. Grease is kept free from dirt. Gun is spring fed with hydraulic coupler and is nickel plated.

Check No. 18 on Reply Card for more Details

PLUG VALVE: Contamination of liquids is prevented by the aluminum bronze plug valve made by Ampco Metal Inc., Milwaukee 4, Wis. Features of the leakproof valve are: No resistance to flow when open, no turbulence, self-cleaning and easy to operate. Furnished with any type connection, it is made in sizes ½ to 4 inches.

Check No. 19 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

STEEL PRICES—Most steel producers have effected upward revisions in price schedules averaging better than $9 per ton, but the situation continues extremely fluid as competitive weaknesses and inequalities of the individual steelmakers come to light. As a result, some time is likely to elapse before the market settles down to relative stability.

Indicative of the situation is action of Bethlehem Steel Co. last week in reducing prices $1 to $3 per ton on a substantial list of selected items to correct its competitive position. Only the week preceding Bethlehem had effected a general price markup. The reduction leaves its quotations well above levels prevailing before the original price action. Similar adjustments, it is believed, will be made by other producers as experience dictates so that consumers can anticipate shifting price levels for some time to come.

MULTIPLE PRICES—Contributing to steel buyers' confusion are differences in prices on various products at the separate producing points. Such lack of uniformity makes it difficult to estimate costs since material is brought into consuming plants from a number of supply sources.

Lack of uniformity in prices stems from two factors. 1—Many companies had been quoting certain products above the general market level prior to the price increase. 2—Abandonment of the basing point system of pricing has placed local producers in position to dominate home markets.

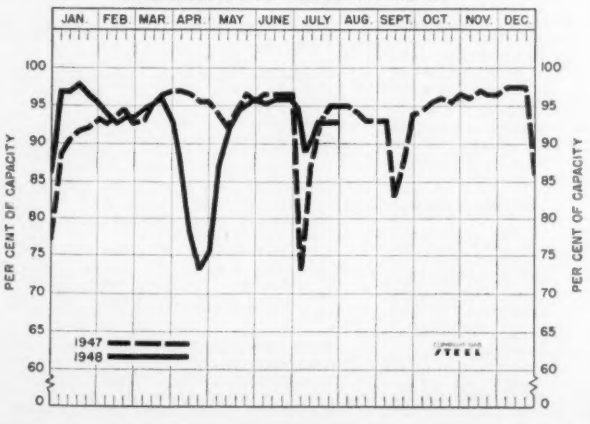
PRICE COMPOSITES—STEEL's price composites rose further last week as details of the recent price adjustments unfolded. The arithmetical average on finished steel rose to $89.09 for the final two weeks of July compared with $80.27 at the begining of the month and $75.41 for the final week of July, 1947; semifinished steel advanced to $74.85 from $68.62 for the beginning of the month and $56.80 for the like week a year ago. Steelmaking pig iron price composite advanced to $43.36 from $42.01 for the preceding week and compared with $35.61 for the like week a year ago; steelmaking scrap to $43.33 from $41.67 and compared with $40.42 for the like week a year ago. STEEL's weighted composite on finished steel advanced to 3.79216c in July from 3.58150c in June and compared with 3.20098c for July, 1947.

CONSUMER REACTION—Consumers have received the higher steel price schedules with mixed emotions. Advances had been anticipated but the general view among buyers is that the increases are much sharper than they had bargained for. Nevertheless, they are going along without too much grumbling, their major concern still being supply. To what extent steel price and wages increases will be passed along by manufacturers to ultimate consumers of finished goods is uncertain. In a number of cases price markups already have been put into effect. More are in immediate prospect.

RAW MATERIALS—Continued twist in the inflationary spiral is reflected in raw material prices. Over the past ten days pig iron has been advanced an average of about $4 per ton, and adjustments in spiegeleisen and ferromanganese prices have been effected by at least two producing interests. Beehive coke prices have been raised $1 to $1.50 per ton, and furnace coke $1. Scrap prices again are heading skyward. Last week the market for steelworks grades advanced at all leading consuming points by $2.50 per ton, the first lift in the steel mill formula ceiling in months.

BASING POINT—All of the larger steel producers have adopted the f.o.b. mill pricing method. Here and there, some smaller interests have not yet abandoned basing point pricing, ruled illegal by the Supreme Court, but it is believed certain the entire industry will be quoting on a mill basis before summer's end. Meanwhile, some hope is held out legislative action will be taken to permit restoration of the basing point pricing, but such legislation cannot be expected before next session of Congress, at earliest.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended July 31	Change	Same Week 1947	Same Week 1946
Pittsburgh	92.5	+ 0.5	99	95
Chicago	89.5	+ 1.5	94	89.5
Eastern Pa.	90	None	94	84
Youngstown	102	+ 2	90	88
Wheeling	82.5	— 6.5	89	93.5
Cleveland	99	None	93	90
Buffalo	99	— 2	88.5	88.5
Birmingham	100	None	99	99
New England	83	None	90	75
Cincinnati	103	+ 7	94	85
St. Louis	78	None	84.5	54.5
Detroit	98	— 2	92	86
Estimated national rate	93	None	95	88.5

Based on weekly steelmaking capacity of 1,802,476 net tons for 1948; 1,749,928 tons for 1947; 1,762,381 tons for 1946.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	July 31	July 23	Month Ago July 1948	Year Ago Aug. 1947	5 Years Ago Aug. 1943
Finished Steel	$89.09	$89.09	$83.80	$75.41	$56.73
Semifinished Steel	74.85	74.85	71.11	56.80	36.00
Steelmaking Pig Iron	43.36	42.01	41.42	36.06	23.00
Steelmaking Scrap	48.33	41.67	41.43	39.00	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

July 1948	3.79216c
June 1948	3.58150c
July 1947	3.20098c
July 1943	2.45880c

***STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

†**FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. June and July, 1948 figures are preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton; others dollars per gross ton.

Finished Materials

	July 31 1948	July 1948	May 1948	Aug. 1947
Steel bars, Pittsburgh mills	3.45c	3.105c	2.875c	2.90c
Steel bars, Chicago mills	3.35	3.065	2.875	2.90
Shapes, Pittsburgh mills	3.25	2.975	2.775	2.80
Shapes, Chicago mills	3.25	2.965	2.775	2.80
Plates, Pittsburgh mills	3.50	3.155	2.925	2.95
Plates, Chicago mills	3.40	3.115	2.925	2.95
Sheets, hot-rolled, Pittsburgh mills	3.275	2.975	2.775	2.80
Sheets, cold-rolled, Pittsburgh	4.00	3.70	3.50	3.55
Sheets, No. 10 galv., Pittsburgh	4.40	4.10	3.90	3.90
Sheets, hot-rolled, Gary mills	3.25	2.965	2.775	2.80
Sheets, cold-rolled, Gary mills	4.00	3.70	3.50	3.55
Sheets, No. 10 galv., Gary mills	4.40	4.10	3.90	3.90
Strip, hot-rolled, Pittsburgh mills	3.275	3.140	3.05	2.80
Strip, cold-rolled, Pittsburgh mills	4.00	3.875	3.775	3.55
Bright basic, wire, Pittsburgh	4.15	3.965	3.725	3.675
Wire nails, Pittsburgh mills	5.15	5.725	5.125	4.25
Tin plate, per base box, Pittsburgh	$6.70	$6.68	$6.60	$5.75

Semifinished

Sheet bars, Chicago mills	$67.00	$62.80	$60.00	$60.00
Slabs, Pittsburgh, Chicago	52.00	47.80	45.00	47.50
Rerolling billets, Pittsburgh	52.00	47.80	45.00	47.50
Wire rod 7/32 to ¼-inch, Pitts.	3.45c	3.419c	3.175c	2.925c

Pig Iron

	July 31 1948	July 1948	May 1948	Aug. 1947
Bessemer, del. Pittsburgh (N.&S. sides)	$44.08	$44.08	$41.038	$37.83
Basic, Valley	43.00	40.60	39.00	36.00
Basic, eastern del. Philadelphia	46.17	44.76	42.17	38.72
No. 2 fdry., del. Pgh. (N.&S. sides)	43.58	43.58	40.538	37.33
No. 2 fdry., del. Philadelphia	46.67	44.27	42.67	39.22
No. 2 foundry, Chicago	43.25	41.10	39.00	36.00
No. 2 foundry, Valley	43.50	41.10	39.50	36.50
Southern No. 2 Birmingham	43.38	40.72	38.63	34.51
Southern No. 2 del. Cincinnati	49.09	46.43	43.90	39.38
Malleable, Valley	43.50	40.30	39.50	36.50
Malleable, Chicago	43.50	41.50	39.50	36.50
Charcoal, low phos., fob Lyles, Tenn.	62.00	59.60	56.50	44.00
Ferromanganese, fob cars, Pittsburgh	151.03	151.15	151.00	140.25

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$40.25	$40.75	$40.25	$39.50
Heavy melt. steel, No. 2, E. Pa.	41.50	40.00	39.00	38.35
Heavy melt. steel, No. 1 Chicago	41.75	40.05	39.25	39.625
Heavy melt. steel, No. 1 Valley	42.75	40.75	40.25	40.50
Heavy melt. steel, No. 1, Cleveland	42.25	40.25	39.75	38.81
Heavy melt. steel, No. 1 Buffalo	45.50	44.30	43.00	40.88
Rails for rerolling, Chicago	62.50	57.80	51.75	47.125
No. 1 cast, Chicago	70.00	68.50	66.00	43.50

Coke

Connellsville, beehive furnace	$14.25	$14.25	$12.94	$12.00
Connellsville, beehive foundry	17.00	17.00	15.06	14.50
Chicago, oven foundry, ovens	19.86	20.75	18.50	18.50

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $100-105 per gross ton. Forging quality $50 per net ton, mill, except: $50-$61, Youngstown, Cleveland, Buffalo, South Chicago mills.

Alloy Steel Ingots: $51 per net ton, mill, except: $52, Buffalo and Johnstown, Pa.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except $62, Conshohocken, Pa., mill; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except $68, Conshohocken, Pa., mill.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill.

Sheet Bars: $67 nom., per net ton, mill; sales in open market $110-$115 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill; some sellers quoting up to $120 per gross ton.

Wire Rods: Basic and acid open-hearth, 7/32 & ⅜-inch, inclusive, $3.40 per 100 lb, mill, except $3.70 Worcester mill. Basic open-hearth and bessemer, not resulphurized, 7/32 to 47/64-inch, inclusive, $3.50, mill.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in. (Base 20 tons one size): 3.35c, mill, except: 3.55c, Ecorse, Mich, Monessen and Aliquippa, Pa., mills; 3.35-3.55c, Pittsburgh mills; 4.05c, Pittsburgh and Torrance, Calif., mills.

Rail Steel Bars: (Base 10 tons): 3.35c, mill.

Hot-Rolled Alloy Bars: 3.75c, mill.

Hot-Rolled Alloy Bar Shapes: 4.00c, mill.

Cold-Finished Carbon Bars (Base 20,000-39,999 lb): 4.00c, mill, except: 3.95c, Pittsburgh mill; 4.25c, Monessen, Pa., mill; 4.40c, Newark, N. J., Hartford and Putnam, Conn., mills.

Cold-Finished Alloy Bars: 4.65c, mill, except 4.75c, Monessen, Pa., mill; 4.95c, Worcester, Mass., mill.

Reinforcing Bars (New Billet) to Fabricators: 3.35c, mill, except: 3.55c, Monessen, Pa., mill; 4.05c, Pittsburgh and Torrance, Calif., mills.

Reinforcing Bars (Rail Steel): Prices upon application.

Iron Bars: Single Refined: 7.70c, (hand puddled), Pittsburgh mill; 8.65c, Economy, Pa., mill. Double Refined: 9.75c (hand puddled), Pittsburgh mill; 10.00c, Economy, Pa., mill. Staybolt: 11.25c (hand puddled), Pittsburgh mill; 10.20c, Economy, Pa., mill.

High-Strength, Low Alloy Bars: 5.10c, mill, except: 5.40c, Ecorse, Mich., mill.

Sheets

Hot-Rolled Sheets (18 gage and heavier): 3.25c, mill, except 3.25-3.30c, Pittsburgh and Cleveland, mills; 3.45c, Ecorse, Mich., mill; 3.95c, Pittsburg and Torrance, Calif., mills; 5.00c, Conshohocken, Pa., mill.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 5.05c, Torrance, Calif.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Granite City, Ill., and Ecorse, Mich., mills; 4.95c, Pittsburg, Calif., mill.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill, except: 4.60c, Granite City, Ill., mill; 5.15c, Pittsburgh and Torrance, Calif., mills.

Galvannealed Sheets: 4.95c, mill.

Culvert Sheets, No. 16 flat (based on 5-cent zinc; corrugated 10 cents extra): Copper alloy: 5.00c, mill, except: 5.40c, Granite City, Ill., mill; 5.75c, Pittsburg and Torrance, Calif., mills.
Copper-iron or pure iron: 5.35c mill, except, 5.75c, Granite City, Ill., mill.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: 7.75c, mill.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Enameling Sheets, No. 12: 4.40c, mill, except: 4.60c, Granite City, Ill., mill; 4.70c, Ecorse, Mich., mill.

Electrical Sheets, No. 24: Field: 5.15c, mill.
Armature: 5.45c, mill, except: 5.65c, Granite City, Ill., mill.
Electrical: Hot-rolled, 5.95c, mill, except: 6.15c, Granite City, Ill., mill.
Motor: 6.70, mill, except: 6.90c, Granite City, Ill., mill.
Dynamo: 7.50c, mill, except: 7.60c, Granite City, Ill., mill.
Transformer 72, 8.05c, mill; 65, 8.65c, mill; 58, 9.30c, mill; 58, 9.30c, mill; 52, 10.10c, mill.

High-Strength, Low Alloy Sheets: Hot-rolled, 4.95c,mill, except: 5.25c, Ecorse, Mich., and Conshohocken, Pa., mills.

Cold-rolled, 6.05c, mill, except: 6.35c, Ecorse, Mich., mill.

Strip

Hot-Rolled Strip: 3.25c, mill, except: 3.25-3.30c, Chicago, Cleveland mills; 3.45c, Ecorse, Mich., mill; 4.00c, Pittsburg and Torrance, Calif., mills.

Cold-Rolled Strip (0.25 carbon and less): 4.00c, mill, except: 4.00-4.25c, Chicago mills; 4.20c, Ecorse, Mich., mill, 4.50c, New Haven, Conn., mill.

Cold-Rolled Alloy Strip: 9.35c, mill, except 9.65c, Worcester, Mass., mill.

Cold-Finished Spring Steel: 0.26-0.40 carbon, 4.10c, mill; over 0.40 to 0.60 carbon, 5.50c, mill; over 0.60 to 0.80 carbon, nominal; over 0.80 to 1.05, nominal; over 1.05 to 1.35, nominal; add 0.20c for Worcester mill.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.25c, Ecorse, Mich., mill. Cold-rolled, 6.05c, mill, except: 6.35c, Ecorse, Mich., mill.

Tin, Terne Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $6.60-$6.80; 1.50 lb coating $6.80-$7.00.

Electrolytic Tin Plate: Per base box of 100 lb, 0.25 lb tin, $5.80-$6.00; 0.50 lb tin, $6.00-$6.20; 0.75 lb tin, $6.20-$6.40.

Can Making Black Plate: Per base box of 100 lb, 55 to 70 lb basis weight, $5.20-$5.30; 75 to 95 lb basis weight, $5.10-$5.20; 100 to 128 lb basis weight, $5.20-$5.30.

Hollowware Enameling Black Plate: 29-gage, 4.75-4.95c per lb.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $5.90-$6.10. Granite City, $6.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $15.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.40-3.60c, Pittsburgh and Cleveland mills; 3.65c, Ecorse, Mich., mill; 3.75c, Coatsville, Pa., mill; 3.95c, Claymont, Del., and Conshohocken, Pa., mills; 5.85c, Harrisburg Pa., mill.

Floor Plates: 4.55c, mill, except: 4.45c, Conshohocken Pa., mill.

Open-Hearth Alloy Plates: 4.40c, mill, except: 5.10c, Coatesville, Pa., mill.

Clad Steel Plates (10% cladding): Coatesville mill: Nickel clad, nom.; inconel-clad, nom.; monel-clad, nom.

Wrought Iron: Nom., Economy, Pa.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.30c, Conshohocken, Pa., mill; 5.65c, Ecorse, Mich., mill.

Shapes

Structural Shapes: 3.25c, mill, except: 3.85c, Torrance, Calif.

Beams, Wide Flange: 3.20c, mill.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.45c, Worcester, Mass., mill; 5.10c, Pittsburg, Calif., mill.

Basic MB Spring Wire, 5.55c, mill, except: 5.85c, Worcester, Mass., and Trenton, N. J., mills; 6.50c, Pittsburg, Calif., mil.

Upholstery Spring Wire, 5.20c mill, except: Worcester, Mass., Trenton, N. J., and New Haven, Conn., mills.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill, except: 5.10c, Worcester, Mass., mill; 5.75c, Pittsburg, Calif., mill. Galvanized 6 to 8 Gage base), 5.25c, mill, except: 5.55c, Worcester, Mass., mill; 6.20c, Pittsburg, Calif., mill.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Column 103, mill, except: Column 109, Worcester, Mass., mill; Column 123, Pittsburg, Calif., mill; 5.20c per pound, Aliquippa, Pa., mill.

Woven Fence (9 to 15½ Gage, inclusive): Column 109, mill, except Column 132, Pittsburg, Calif., mill.

Barbed Wire: Column 123 mill, except Column 143, Pittsburg, Calif., mill.

Fence Posts with clamps): Column 114, mill.

Bale Ties (single loop): Column 106, mill, except: Column 130, Pittsburg, Calif., mill.

Rails, Supplies

Rails: Standard, over 60-lb: $3.20 per 100 lb, mill.

Light billet): $3.55 per 100 lb, mill.

Light (rail steel): prices on application.

Girder Rails: No. 1, 3.70c, mill; No. 2, 3.60c, mill.

Relaying, 60 lb and over: $60-$65 per net ton, f.o.b. warehouse.

Railroad Supplies: Track bolts, $7.50 per 100 lb, mill.

Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Calif., mill.

Splice Bars: 4.25c, mill.

Standard Spikes: 5.25c, mill, except: 5.35c, Fairfield, Ala., and Indiana Harbor, Ill., mill.

Axles: 5.20c, mill.

Tubular Goods

Standard Steel Pipe: Mill prices in carlots, threaded and coupled, to consumers about $200 a net ton.

	Butt Weld			Butt Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	39½	12	1	47½–48½	31½–32½
¼	39½	16½	1¼	48–49	32–33
⅜	36	12	1½	48½–49½	32½–33½
½	42–43	24½–25½	2	49	33
¾	45–46	28½–29½	2½, 3	49½	33½

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	39½	23	39	22½	38½	22
2½ & 3	43½	27	42	25½	41½	25
3½–6	46½	30	44	27½	43½	27

Line Steel Pipe: Mill price in carlots to consumers about $200 a net ton.

	Butt Weld		Butt Weld
In.		In.	
⅛	38½	1	46½-47½
¼	38½	1¼	47-48
⅜	35	1½	47½-48½
½	41-42	2	48
¾	44-45	2½ & 3	48½

In.	Lap Weld	Elec. Weld	Seamless
2	38½	38	47½
2½ & 3	41½	41	40½
3½–6	44½	44	43½
8	46½	46	45½
10	46	45½	45
12	42	44½	44

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

	Butt Weld			Lap Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅜	+59½	+88	1¼	+22	+46½
½	+20½	+46	1½	+15½	+39
¾	+10½	+35	2	+ 7½	+30
1 and 1¼	+ 4½	+26	2½-3½	+ 5	+25.5
1½	— 1½	+22½	4	List	+19½
2	— 2	+22	4½-8	+ 2	+21
			9-12	+12	+30½

Boiler Tubes: Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24", inclusive.

		——Seamless——		—Elec. Weld—	
O.D.	B.W.	Hot	Cold	Hot	Cold
In.	Ga.	Rolled	Drawn	Rolled	Drawn
1	13	....	13.39	11.51	11.51
1¼	13	....	15.87	11.48	13.64
1½	13	....	17.71	12.69	15.22
1¾	13	....	20.15	14.43	17.31
2	13	....	22.56	16.17	19.39
2¼	13	....	25.16	18.02	21.62
2½	12	$23.54	27.70	19.86	23.80
2½	12	25.79	30.33	21.75	26.06
2¾	12	27.33	32.14	23.05	27.63
3	12	28.68	33.76	24.18	29.00
3¼	11	33.39	39.29	28.16	33.77
3½	11	35.85	42.20	30.23	36.27
4	10	44.51	52.35	37.53	44.99
4½	9	58.99	69.42	....	....
5	9	68.28	80.35	....	....
6	7	104.82	123.33	....	....

Pipe Cast Iron: Class B, 6-in. and over $79.50 per net ton, Birmingham; $84.50, Burlington, N. J.; $91.12, del. Chicago; 4-in. pipe, $5 higher; class A pipe, $5 a ton over Class B.

Bolts, Nuts

(New price schedules being prepared; see page 140 for latest details)

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 19c per cwt in carlots, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step, plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	45 off
⅝ and ¾ x 6-in. and shorter	46 off
¾-in. and larger x 6-in. and shorter	43 off
All diameters longer than 6-in.	41 off
Tire bolts	35 off
Step bolts	43 off
Plow bolts	54 off
Lag bolts, 6 in. and shorter	46 off
Lag bolts, longer than 6 in.	44 off

Stove Bolts

In packages, nuts separate, 65-10 off; bulk 75 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
7/16-in. and smaller	46 off	.....
½-in. and smaller	.....	44 off
½-in.-1-in.	44 off	.....
⅝-in.-1-in.	.....	43 off
1⅛-in.-1½-in.	42 off	41 off
1⅝-in. and larger	.....	35 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	53 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter	48 off
¾, ⅞, & 1 x 6 and shorter	44 off

Square Head Set Screws

Upset 1-in. and smaller	57 off
Headless, ¼-in. and larger	40 off
No. 10 and smaller	52 off

Rivets

Fob Pitts., Cleve., Chicago, Birmingham
Structural ½-in. and larger 5.65c
Fob Lebanon, Pa.
Structural ½-in. and larger 5.65c*
7/16-in. and larger ..... 55 off*

* Plus 19c per cwt in cl; 26c in lcl.

Washers, Wrought

Fob Pitts., Chicago, Philadelphia, to jobbers and large nut and bolt mfrs. ..... $1-$2 off

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.5c
18	4	3	...	...	114.5c
18	4	2	...	9	168.5c
1.5	4	1	8.5	...	65.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

Stainless Steels

(Revised price schedules being prepared)

Base, cents per lb, Pittsburgh, Chicago, Cleveland, Bethlehem, Canton, Massillon, Middletown, Watervliet, Dunkirk, Syracuse, Reading, Ft. Wayne, Titusville, Brackenridge, Jersey City, W. Leechburg, Baltimore and Washington, Pa.

Grade	Bars, Wire, Shapes	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301	26.00c	29.50c	37.00c	22.00c	28.00c
302	26.00	29.50	37.00	23.50	30.50
303	28.50	31.50	39.00	29.50	36.00
304	27.50	31.50	39.00	25.50	32.50
308	31.50	37.00	44.50	31.00	38.00
309	39.00	43.50*	51.00*	40.50	51.00
310	53.50	56.50†	57.50‡	53.00	61.00
316	43.50	48.00	52.00	43.50	52.00
321	31.50	37.00	44.50	32.00	41.50
347	36.00	41.50	49.00	36.00	45.50
431	21.00	24.00	31.50	19.00	24.50
440A	26.00	31.00	36.50	26.00	30.50
STRAIGHT CHROMIUM STEEL					
410	20.50	23.50	29.00	18.50	24.00
416	21.00	24.00	29.50	20.00	25.50
420	26.00	31.00	36.50	26.00	39.50
430	21.00	24.00	31.50	19.00	24.50
430F	21.50	24.50	32.00	20.50	27.00
442, 443	24.50	28.00	35.50	26.00	35.00
446	30.00	33.00	39.50	38.00	56.50
§501	9.00	13.00	17.50	13.00	18.50
§502	10.00	14.50	18.50	14.50	19.50
****STAINLESS CLAD STEEL (20%)**					
304	....	24.00	22.00	....	....
410	....	22.00	20.00	....	....
430	....	22.50	20.50	....	....
446	....	29.00	27.00	....	....

One producer quotes: * 6.50c higher, † 3.50c higher, ‡ 10.00c higher. § Low chromium. ** Fob Pittsburgh, Washington and Coatesville, Pa.; plate prices include annealing, pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$44.00	$44.50	$45.00	$45.50
Newark, N. J., del.	46.39	46.89	47.39	47.89
Brooklyn, N. Y., del.	....	48.40	48.90	....
Philadelphia, del.	46.17	46.67	47.17	47.67
Birmingham, furnace	42.88	43.38	....	....
Cincinnati, del.	....	49.09	....	....
Buffalo, furnace	44.00	44.00	44.50	45.00
Boston, del.	52.42	52.42	52.92	....
Rochester, del.	46.22	46.22	46.72	47.22
Syracuse, del.	47.025	47.025	47.525	48.025
Chicago, furnace	42.50-43.00	43.00-43.50	43.50	44.00
Milwaukee, del.	44.22-44.72	44.72-45.22	45.22	45.72
Muskegon, Mich., del.	....	49.65-50.15	50.15	....
Cleveland, furnace	43.00	43.50	43.50	44.00
Akron, del.	45.17	45.67	45.67	46.17
Duluth, furnace	43.00	43.50	44.00	44.50
Erie, Pa., furnace	42.50	43.00	43.50	44.00
Everett, Mass., furnace	....	48.75	49.25	....
Geneva, Utah, furnace	....	43.50	....	....
Seattle, Tacoma, Wash., del.	....	50.63	....	....
Portland, Oreg., del.	....	50.63	....	....
Los Angeles, San Francisco.	....	50.63	....	....
Granite City, Ill., furnace	45.25	45.75	46.25	....
St. Louis, del.	46.00	46.50	47.00	....
‡Neville Island, Pa., furnace.	42.00	42.50	42.50	43.00
Pittsburgh, del., N.&S. Sides	43.08	43.58	43.58	44.08
Pittsburgh (Carnegie), furnaces	43.00	43.50	43.50	44.00
Sharpsville, Pa., furnace	43.00	43.50	43.50	44.00
Steelton, Pa., furnace	44.00	44.50	45.00	45.50
Struthers, O., furnace	42.50	....	....	....
Swedeland, Pa., furnace	45.00	45.50	46.00	46.50
Toledo, O., furnace	42.50	43.00	43.50	44.00
Cincinnati, del.	47.05	47.55	....	....
Youngstown, O., furnace	43.00	43.50	43.50	44.00
Mansfield, O.	46.87	47.37	47.37	47.87

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaco; $1.73 Verona; $1.94 Brackenridge; $1.08 to Ambridge and Aliquippa.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base) .$53.50
6.51-7.00 . .$54.75
7.01-7.50 . . 56.00
7.51-8.00 . . 57.25
8.01-8.50 . . 58.50
8.51-9.00 . . 59.75
9.01- 9.50. 61.00
9.51-10.00. 62.25
10.01-10.50. 63.50
10.51-11.00. 64.75
11.01-11.50. 66.00

Fob Jackson, O., per gross ton; Buffalo furnace $4.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $78.75, Niagara Falls; $78 open-hearth and $79 foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.05% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn. .....$62 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $50. Philadelphia $52.81, delivered. Intermediate phosphorus, Central furnace, Cleveland, $46.00.

Differentials

Prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $35; less than 60% $32.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace	$13.50-$15.00
Connellsville, foundry	16.00- 18.00
New River, foundry	16.50
Wise county, foundry	15.35
Wise county, furnace	14.60

† Nominal.

Oven Foundry Coke

Kearney, N. J., ovens	$21.50
Chicago, ovens	20.40
Terre Haute, ovens	21.00
Milwaukee, ovens	21.15
New England, del.	22.75
Birmingham, del.	17.86
Indianapolis, ovens	20.85
Cincinnati, del.	21.40
Ironton, O., ovens	18.25
Erie, Pa., del.	22.45
Painesville, O., ovens	20.90
Cleveland, del.	22.45
Buffalo, del.	23.10
Detroit, del.	21.65
Philadelphia, ovens	20.55
Swedeland, Pa., ovens	20.50
Portsmouth, O., ovens.	19.25

Coal Chemicals

Spot, cents per gallon

Pure and 90% benzol	21.00†
Toluol, two degrees	28.00
Industrial xylol	28.00
Solvent naphtha	28.00

Per pound fob works

Phenol (car lots, returnable drums)	13.00
Do., less than carlots	13.75
Do., tank cars	12.00

Eastern plants, per pound

Naphthalene flakes, balls, bbl. to jobbers, "household use"	12.00

Per ton, bulk, fob plants

Sulphate of ammonia.....$40.00

Refractories

(Prices per 1000 brick, fob plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, or Farber, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., $100.

High-Heat Duty: Salina, Pa., $85; Woodbridge, N. J., $86; St. Louis, or Farber, Vandalia, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., $80.

Intermediate-Heat Duty; St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, Haldeman, or Athens, Ky., Troup, Tex., Stevens Pottery, Ga., or Portsmouth, O., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Pa., Bessemer, Ala., $66.

Ladle Brick

Dry Press: $50.
Wire Cut: $48.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., $83; Beach Creek, Pa., $73.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., $89; Lehi, Utah, Los Angeles, $95.
Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., $80.
Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)
Chrome brick or chemical-bonded chrome brick, $69, magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, fob works, Chewelah, Wash.)
Domestic dead-burned, ⅝" grains: Bulk, $31; single paper bags, $35.50.

Dolomite

(Base prices per net ton)
Domestic, dead-burned, bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibonsburg, Woodville, O., $11.85; Thornton, McCook, Ill., $11.95; Dolly Siding, Bonne Terre, Mo., $12.05.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural) Lower Lake Ports

(Any increase or decrease in R. R. freight rates, dock handling charges and taxes thereon effective after Apr. 1, 1948, are for buyer's account.)

Old range bessemer	$6.60
Old range nonbessemer	6.45
Mesabi bessemer	6.35
Mesabi nonbessemer	6.20
High phosphorus	6.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

Swedish basic, 60 to 68%	14.50
Brazil iron ore, 68-69% fob Rio de Janeiro, nom.	5.50-6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26-$28

Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African

48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00

South African (Transvaal)

44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50

Brazilian—nominal

44% to 2.5:1 lump	$33.68

Rhodesian

45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00

Domestic (seller's nearest rail)

48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo., cont., Mines	$0.75

WAREHOUSE STEEL PRICES

Warehouse steel price schedules are being revised to reflect recent changes in producers' pricing methods. Following prices are nominal and are those which were in effect prior to the mid-July advances.

	SHEETS			STRIP		BARS				PLATES	
	H-R 10 Ga.	C-R 17 Ga.	Gal. *10 Ga.	†H-R	†C-R	H-R Rds. ⅝" to 3"	C-F Rds. ½" & up	H-R Alloy **4140	Structural Shapes§§	Carbon ⅝"-¾"	Floor ⅝" & Thicker
Boston (city) ..	5.08	5.84[4]	6.28[4]	5.64	6.90	5.09	5.96	7.70	4.94	5.23	6.89
Boston (c'try)..	4.98	5.64[4]	6.08[4]	5.44	...	4.89	...	...	4.74	5.03	6.69
New York (city)	4.94	5.80	6.13	5.58	...	5.05	5.78	7.23	4.77	5.09	6.58
New York (c'try)	4.79	5.65	5.98	5.43	...	4.90	...	...	4.62	4.94	6.43
Phila. (city)...	4.87	5.81	5.92	5.36*†	...	4.91	5.73	7.30	4.59	4.87	6.36
Phila. (c'try.)..	4.72	5.66	5.77	5.21*†	...	4.76	...	...	4.44	4.72	6.21
Wash. (city) ..	4.81	...	...	5.08	...	5.14	5.79	...	4.98	5.03	6.68
Wash. (c'try.) .	4.71	...	...	4.98	...	5.04	...	...	4.88	4.93	6.58
Balt. (city) ...	4.27†	5.59	5.62	4.79	...	4.84	5.66	...	4.69	4.72	6.09
Balt. (c'try.) .	4.12†	5.44	5.40	4.64	...	4.69	...	...	4.54	4.57	5.94
Norfolk, Va. ..	4.90	...	...	...	...	5.20	6.00	...	5.15	5.15	6.90
Memphis (city)	4.91[20]‖	5.98[3]†	...	5.11[30]	...	5.01[20]	5.88	...	5.01[30]	5.21[30]	6.83[30]
Memphis (c'try)	4.81[20]‖	5.88[3]†	...	5.01[30]	...	4.91[20]	5.78	...	4.91[20]	5.11[30]	6.73[30]
Buffalo (city) .	4.25	5.20[3]	6.05	5.25	5.97	4.40	5.10	6.85	4.40	5.00	6.25
Buffalo (c'try.)	4.10	5.05[3]	5.50	4.70	5.82	4.25	4.95	6.85	4.25	4.45	5.75
Pitts. (city) ..	4.20-4.25‖	5.05-5.10[3]†	5.60-5.65	4.30-4.35	5.35	4.35-4.40	5.05-5.10	6.70	4.35-4.40	4.55	5.90
Pitts. (c'try) ..	4.05-4.10‖	4.85-4.95[3]†	5.40-5.50	4.15-4.20	5.20	4.20-4.25	4.85-4.95	6.70	4.20-4.25	4.40	5.75
Cleve. (city) ..	4.45	5.10[3]	5.84	4.52	5.25	4.40	5.00-5.10	7.14	4.67	4.60	5.90
Cleve. (c'try.) .	4.30-4.90	4.95-5.75[3]	...	...	5.10	4.25	4.85-4.95	...	...	4.45	5.75
Detroit	4.66	5.31	6.10	4.75	5.97	4.61	5.49	7.47	4.80	4.95	6.25
Cincinnati	4.51-4.66	5.22	5.77	4.80	6.00	4.76	5.59	...	4.80	4.96	6.21
Indianapolis ...	4.52	5.01[3]	5.96	4.62	5.87	4.67	5.52	8.85	4.67	4.87	6.17
Chicago (city) .	4.40	5.10[3]	5.55-5.65	4.30	5.35	4.35	5.00	6.70[9]	4.35	4.55	5.80
Chicago (c'try.)	4.25	4.95[3]	5.40-5.50	4.15	5.20	4.20	4.85	6.70[9]	4.20	4.40	5.65
Milwaukee	4.62	5.32[3]	5.77-5.87	4.52-5.02	5.57	4.57	5.334	7.184[9]	4.57	4.77	6.02
St. Paul, Minn..	4.66[6]	5.56[3]†	6.01[6]	4.76	6.29[13]	4.81[6]	5.94[11]	7.84[11]	4.81[6]	5.01[6]	6.26[6]
St. Louis	4.79	5.49[3]	6.27	5.24	5.97	4.74	5.62[12]	8.97	4.74	4.94	6.19
Birming. (city).	4.45[20]‖	...	5.65	4.45[30]	...	4.40[20]	6.09[22]	...	4.40	4.65	6.99
Birming. (c'try.)	4.30[20]‖	...	5.50	4.30[30]	...	4.25[20]	...	...	4.25	4.50	...
Houston, Tex. .	5.75	...	7.36	6.00	...	5.70	7.00	9.25[9]	5.70	5.90	7.20
Omaha, Nebr...	5.31	...	6.76	5.41	...	5.46	6.96	...	5.41	5.66	5.65
Los Angeles ...	5.70‖	7.25[3]	7.30	6.00	8.60	5.45	7.25[1]	9.40[2]‡‡	5.15-5.30	5.35	7.40
Seattle-Tacoma.	5.45[17]‖	7.25[3]‡	7.10	6.15[17]	...	5.65[17]	7.35[1]	8.70[12]	5.30[17]	5.60[17]	7.65[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 39,999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 14,999 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [13]—2000 lb and over; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [20]—1500 to 39,999 lb; [30]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; ‖ 18 gage and heavier; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham; ‡‡ annealed; §§ except wide flange beams, which are 0.05c lower; 12G. & heavier and includes machine straightening.

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $57, Palmerton, Pa., $56, Pittsburgh; (16% to 19% Mn.) $1 per ton lower. **Standard Ferromanganese:** (Mn 78-82%, C 7% approx.). Carload, lump, bulk $147 per gross ton of alloy Johnstonwn, Pa., mill. Carload, lump, bulk, $150 fob Rockwood, Tenn.; $148 fob Aetna, Pa., or $148.65 within Pittsburgh switching limits. Add or subtract $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%. West Coast Prices: Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with railroad freight allowed on shipments of 25 gross tons or more.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 22.5c per lb of contained Mn, carload packed 23.25c, ton lot 24.35c, less ton 25.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17.25c, ton lot 18.35c, less ton 19.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

Silicomanganese: (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.8c per lb of alloy, carload packed, 8.55c, ton lot 9.45c, less ton 10.45; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Eastern Zone, contract, c.l., lump, bulk 18.6c per lb of contained Cr, c.l., packed 19.5c, ton lot 20.65c, less ton 22.05c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Eastern Zone, contract, c.l., 8MxD, bulk 20.1c per lb of cotnained Cr, c.l., packed 21.0c, ton lot 22.35c, less ton 24.1c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 28.5c per lb of contained Cr, 0.04% C 27.5c, 0.05% C 27.0c, 0.06% C 26.5c, 0.10% C 26.0c, 0.15% C 25.5c, 0.20% C 25.25c, 0.50% C 25.0c, 1% C 24.5c, 2% C 24.25c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, add C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 25c per lb of contained chromium, carload, packed 26.1c, ton lot 27.3c, less ton 29.1c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

Chromium Metal: (Mn. 97% Cr and 1% Fe). Eastern Zone, contract, carload, 1" x D; packed, max. 0.50% C grade, 93c per lb of contained chromium, ton lot 94.5c, less ton 97c; Central, add 1.5c for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight allowed. Spot, add 5c.

SILICON ALLOYS

20-30% Ferrosilicon: Contract, carload, lump, bulk, 16.50c per lb. of contained Si, fob Niagara Falls, N. Y.

50% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 9.3c per lb of contained Si, carload packed 10.9c, ton lot 12.35c, less ton 14.0c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (All 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 11.8c per lb of contained Si carload packed 13.1c, ton lot 14.25c, less ton 15.5c; Central, add 0.3c for c.l. add 0.75c for l.c.l.; Western, add 1.05c for c.l. and 5c for l.c.l. Freight allowed. Spot, add 0.3c.

85% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 13.3c per lb of contained Si, carload packed 14.55c, ton lot 15.55c, less ton 16.7c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% fersosilicon prices.

90% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk, 15c per lb of contained Si carload packed 16.2c, ton lot 17.15c, less ton 18.2c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Over 97% Si and 1% max. Fe.) Eastern Zone, c.l., lump, bulk, regular 17.3c per lb of Si, c.l. packed 18.5c, ton lot 19.4c, less ton 20.4c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing over 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb cl 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c; smaller lots 8.65c. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 12.5c per lb or briquet, carload packed 13.2c, ton lot 14.0c, less ton 14.9c; Central, add 0.25c for

(*Please turn to Page 152*)

Lead and Zinc Prices Advance

Nonferrous metal markets succumb to inflationary pressures with lead rising two cents to record high and zinc three cents to highest level since World War I. Platinum rises. Copper price tone strong

New York—The nonferrous metal markets caught the inflationary fever last week and prices on various metals were advanced sharply.

Lead went up 2 cents per lb to 19.50c, highest in history, and zinc was raised 3 cents to 15 cents, highest since the first world war when it was quoted above 21 cents per lb.

At the same time signs of an advance in copper appeared with one small high cost domestic producer reporting sales at 23.50c, Connecticut Valley, an advance of 2 cents per lb. Platinum also was advanced $5 an ounce by a leading refiner to $93 an ounce for bulk quantities.

Copper—Strong tone prevails in this market. Recent wage and materials cost increases are exerting increasing pressure on the present level of the market, these recent cost boosts being reported as raising the cost of copper mining an average of 1.25 cents to 1.50 cents per lb.

Sales of domestic coper were made late last week by one small producer at 23.50c, Connecticut Valley, increase of 2 cents a pound, and it was generally believed in the market that this action was the forerunner of a general advance. However, up to press time other producers had not followed the rise. In view of the shortage of the metal it was believed that once an upturn in price started it would spread industry-wide.

An interesting development of the week was the refusal of the Bureau of Federal Supply and the Munitions Board to confirm or deny a report that the government had fulfilled its requirements for the purchase of copper for the strategic stockpile for the first six months of the fiscal year and is now setting up a quota for the second half. Informed sources said the government purchases had been made at 21.50c per lb.

Copper Wire—New business booked by brass and wire mills and other makers of copper products during June topped any other month in the past two and a half years. Orders placed on the books of these makers of copper and brass products required 147,819 tons of copper and compared with 124,272 tons required for May orders. The June bookings were the best for any month since January, 1946, when orders taken required 149,703 tons of copper.

Part of the good business in June was caused by anticipation of higher prices, which later materialized.

Brass Ingots—Output of brass ingot in January totaled 26,323 short tons, 2 per cent more than in December but 4513 tons or 15 per cent less than in January, 1947. Shipments to consumers during January were 2396 tons greater than production, causing ingot stocks to decline. Scrap stocks increased as ingot makers purchased 1771 tons more than they used. Consumption of brass scrap totaled 33,743 tons in January, compared with 36,942 tons in January, 1947.

Lead—Domestic lead prices advanced last week, rising 2 cents per lb to a record high of 19.50c, delivered New York. At the same time the American Smelting & Refining Co. lifted its price for Mexican lead by the same amount to 19.25c at Gluf ports for sale to consumers outside the U.S. Delivered cost to Europe is estimated at 20.00c per lb.

Lead is in the shortest supply of all the metals, a condition aggravated by strikes at mines, refineries and smelters in Mexico during the spring. At the moment some important lead producing properties in this country are closed by strikes. Meanwhile American buyers have been paying premium prices for foreign metal and also lead recovered from scrap.

Domestic lead consumption amounted to 89,869 short tons in April, a decline of 8 per cent from the total used in March. Average daily consumption was 2996 tons in April, compared with 3141 tons in March. Of total consumption, 75 per cent was used in the manufacture of metal products, 15 per cent for pigments, 8 per cent for chemicals and 2 per cent for miscellaneous and unclassified uses.

Consumers' stocks of lead continued to gain in April. Total inventories at the end of the month were 2 per cent larger than at the end of March.

Zinc—The price of slab zinc was advanced 3 cents per lb last week to a level of 15 cents, E. St. Louis for prime western grade by American Zinc, Lead & Smelting Co. Usual differentials were applied on other grades. The company reported that its action followed establishment of a $95 per ton quotation at Joplin, Mo., on zinc concentrates. Also, it was said, the new price takes into consideration increases in cost of labor, fuel and other supplies, which increases the company has been forced to absorb over the past four months. The former price of 12 cents per lb had been in effect since January.

Domestic slab zinc consumption in April declined 9 per cent, reflecting moderate decreases in the use of zinc by all industry groups.

Stocks of zinc dust at producers' plants dropped 32 per cent during the month and were at the lowest level since September, 1944. Producers' stocks of zinc oxide increased 16 per cent. Slab zinc stocks at zinc melters were 5 per cent less than at the end of March, while consumers' stocks of slab zinc increased 4 per cent during the month.

Aluminum—Production of primary aluminum established a new postwar record in May. Output totaled 55,450 short tons, an increase of 4 per cent over the 53,277 tons produced in April. Power delivery to reduction plants was sufficient to permit a high level of operation throughout the month.

Shipments and use of pig aluminum again lagged behind production and stocks at reduction plants increased for the second straight month. The decline in shipments, however, was not indicative of the demand for aluminum which continued strong.

Shipments of aluminum and aluminum-base alloys castings during May totaled 34 million pounds, 12 per cent under the 38 million pounds shipped in April.

Platinum—Last week one leading refiner advanced the price of platinum $5 an ounce to $93 per ounce for bulk quantities and $96 for retail lots. The former prices had been in effect since July 1 at which time an increase of $13 had been effected.

Iridium—Price of this metal also was increased last week $10 an ounce to $110 for bulk and $120 for retail quantities.

In the trade the higher price of platinum is attributed to a tight supply situation combined with increased demand from the jewelry trade. This latter demand is seasonal.

Tin Plate Priced at Mills

Pittsburgh—Carnegie-Illinois Steel Corp. has placed tin plate on a mill price basis and is quoting $6.80 per base box, Irwin Works and Gary, Ind.

Tin plate was not included in the original list of products which U. S. Steel subsidiaries announced would be sold on a mill basis. The latest move removes the uncertainty as to the pricing method for this product.

Canada . . .

Toronto, Ont. — While there has been some slowing down in new order placing in the Canadian steel markets, there has been no slackening in demand. Curtailment in order placing is due almost entirely to the fact that producers are fully booked to the end of third quarter and have not opened books for fourth quarter, and on some lines makers have withdrawn from the market. Recent price advances have had no effect on demand for steel and the market could absorb much greater tonnage than is available. It appears quite definite at this time that steel shortages may become more acute during last quarter, and in the meantime there are no indications of improvement in supply.

Demand for steel sheets continues well in excess of supply and with output fully booked to the end of September, producers have withdrawn from the market. However, deliveries are being made at regular intervals to consumers and warehouse operators, on a quota basis. The recently authorized price increase on black and galvanized sheets has not been put into effect, although mill bookings are on the basis of price at time of shipment.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic, 21.50c, Conn. Valley; Lake, 21.62½c Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 19.50-20.00c; 88-10-2 (No. 215) 29.00c; 80-10-10 (No. 305) 25.25c; No. 1 yellow (No. 405) 15.25-16.00c.

Zinc: Prime western 15.00c, brass special 15.25c, intermediate 15.50c, East St. Louis; high grade 16.00c, delivered.

Lead: Common 19.30-19.35c chemical and corroding 19.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 15.00-16.00c, pigs 13.50-15.00c; metallurgical 94% min. nom. 14.50c. Base prices for 10,000 lb and over, fob shipping point, freight allowed.

Secondary Aluminum: Piston alloy (No. 122 type) 24.00-24.75c; No. 12 foundry alloy (No. 2 grade) 23.50-24.00c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 25.25-25.75c; grade 2, 24.50-25.00c; grade 3, 24.00-24.75c; grade 4, 23.50-24.25c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, fob Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 35.00; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 35.50c, fob Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; shot nom.; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $75-$77 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $20.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $1.75, del.; special or patented shapes, $1.80.

Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 74.62½c per ounce.

Platinum: $93-$96 per ounce.

Palladium: $24 per troy ounce.

Iridium: $110-$120 per troy ounce.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, fob mill.)

Sheet: Copper 35.18c; yellow brass 31.41c; commercial bronze, 95%, 35.05c; 90% 34.52c; red brass, 85% 33.48c; 80% 32.95c; best quality 32.34c; nickel silver, 18%, 43.42c; phosphotbronze, grade A, 5%, 54.15c.

Rods: Copper, hot rolled 31.28c; cold drawn 32.28c; yellow brass, free cutting, 25.94c; commercial bronze, 95% 34.74c, 90% 34.21c; red brass, 85% 33.17c, 80% 32.64c.

Seamless Tubing: Copper 35.22c; yellow brass 34.42c; commercial bronze 90% 37.18c; red brass 85% 36.39c, 80% 35.86c.

Wire: Yellow brass 31.70c; commercial bronze, 95% 35.34c; 90% 34.81c; red brass, 85% 33.77c, 80% 33.24c; best quality brass 32.63c.

Copper Wire: Bare, soft, fob eastern mills, c.l. 26.80 - 28.37½c; l.c.l. 27.30 - 28.87½c; weatherproof, fob eastern mills, c.l. 27.35-29.00c;; l.c.l. 27.85-29.50c; magnet, delivered, c.l. 31.13-31.50c, 15,000 lb or more 31.38-31.75c, l.c.l. 31.88-32.25c.

ALUMINUM

(Revised price schedule pending; effective June 28)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	24.0	...	...
0.135-0.126	12-48	24.5	...	...
0.125-0.096	12-48	24.5	23.1	26.3
0.095-0.077	12-48	25.0	23.2	26.5
0.076-0.061	12-48	25.5	23.4	26.7
0.060-0.048	12-48	25.7	23.6	27.0
0.047-0.038	12-48	26.1	23.8	27.3
0.037-0.030	12-48	26.4	24.1	27.7
0.029-0.024	12-48	26.8	24.4	28.1
0.023-0.019	12-36	27.4	24.8	28.6
0.018-0.017	12-36	27.9	25.3	29.3
0.016-0.015	12-36	28.6	25.9	30.1
0.014	12-24	29.4	26.6	31.1
0.013-0.012	12-24	30.2	27.3	32.0
0.011	12-24	31.1	28.1	33.1
0.010-0.0095	12-24	32.1	29.0	34.3
0.009-0.0085	12-20	33.2	30.0	35.7
0.008-0.0075	12-20	34.4	31.1	37.1
0.007	12-18	35.7	32.3	38.8
0.006	12-18	37.0	33.5	42.6

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T	17S-T	—Hexagonal— R317-T	17S-T
0.125	45.0	44.0	...	...
0.156-0.203	38.5	37.5	...	...
0.219-0.313	35.5	34.5	...	...
0.344	34.0	33.0	...	...
0.375	33.0	32.0	42.5	40.0
0.406	33.0	32.0	...	...
0.438	33.0	32.0	42.5	40.0
0.469	33.0	32.0	...	...
0.500	33.0	32.0	42.5	40.0
0.531	33.0	32.0	...	...
0.563	33.0	32.0	40.5	38.0
0.594	33.0	32.0	...	...
0.625	33.0	32.0	40.5	38.0
0.656	33.0	32.0	...	...
0.688	33.0	32.0	40.5	38.0
0.750-1.000	32.0	31.0	37.0	35.5
1.063	32.0	31.0	35.5	34.0
1.125-1.500	31.0	30.0	35.5	34.0
1.563	31.0	30.0	...	...
1.625	30.0	29.0	34.5	33.0
1.688-2.000	30.0	29.0	...	...
2.125-2.500	29.5	28.5	...	...
2.625-3.375	28.5	27.5	...	...

LEAD

(Prices to jobbers, fob Cleveland, Pittsburgh)

Sheets: Full rolls, 140 sq ft or more, $20.85 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft; $1.25, less than 10 sq ft; $1, circles and segments. Pipe: Full coils, $20.10 per cwt; cut coils, $20.35. Traps and Bends: List price plus 52%.

ZINC

Sheets, 16.50c-17.00c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 15.25c-16.00c, fob mill, 36,000 lb and over. Plates, not over 12-in., 14.25c; over 12-in., 15.25c.

NICKEL

(Base prices, fob mill.)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, fob mill.)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes,45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb. 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9%, flake, fob Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 31.84c; oval, 31.34c; electrodeposited, 31.09c; cast, 30.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 44.00c, fob Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 16.00c; 1000 to 19,900 lb, 15.00c, fob Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.00c; over 250 lb, 24.00c, fob Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; fob Cleveland. Add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 25.00c; 275-lb, or 500-lb bbls. 23.00c, fob Cleveland.

Tin Anodes: Bar, 1000 lb and over 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c, fob Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c. Prices fob Sewaren, N. J.

Zinc Cyanide: 100-lb drums 37.25c, fob Cleveland; 37.00c, Detroit; 36.00c, fob Philadelphia.

Stannous Sulphate: Less than 2000 lb, in 100 lb kegs, 100.00c, in 400 lb bbl. 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)

Prices in cents per pound for less than 15,000 lb fob shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.625	15.375	14.750
Commercial Bronze			
95%	18.125	17.875	17.375
90%	17.625	17.375	16.875
Red brass			
85%	17.500	17.250	16.750
80%	17.250	17.000	16.500
Best Quality (71-79%)	16.625	16.375	15.875
Muntz Metal	14.750	14.500	14.000
Nickel silver, 10%	17.000	16.750	8.500
Phos. bronze, A	20.750	20.500	19.500
Naval brass	15.250	15.000	14.500
Manganese bronze	15.250	15.000	14.375

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 18.50, No. 2 copper 17.50, light copper 16.50, composition red brass 15.00-15.25, auto radiators 12.50-12.75, heavy yellow brass 10.75-11.00, brass pipe, 11.75-12.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 18.50-18.75, No. 2 copper 17.50-17.75, light copper, 16.50-16.75, refinery brass (60% copper), per dry copper content 16.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 17.00-17.25, No. 2 16.00-16.25, light copper 15.00-15.25, No. 1 composition red brass 13.25-13.50, No. 1 composition turnings 12.75-13.00, mixed brass turnings 7.50-7.75, new brass clippings 13.00-13.50, No. 1 brass rod turnings 10.00-10.50, light brass 6.75-7.25, heavy yellow brass 9.25-9.50, new brass rod ends 10.50-11.00, auto radiators, unsweated 10.50-11.00, cocks and faucets 10.25-10.50, brass pipe 10.25-10.50.

Lead: Heavy 15.50-16.00, battery plates 10.00-10.50, linotype and stereotype 17.00-17.50, electrotype 15.00-15.50, mixed babbitt 14.25-14.75, solder joints, 18.75-19.25.

Zinc: Old zinc 6.25-6.75, new die cast scrap 5.25-5.75, old die cast scrap 3.25-3.75.

Tin: No. 1 pewter 65.00-67.00, block tin pipe 83.00-84.00, No. 1 babbitt 51.00-54.00, siphon tops 50.00-52.00.

Aluminum: Clippings 2S 12.50-13.00, old sheets 11.00-11.50, crankcases 11.00-11.50, borings and turnings 5.50-6.00, pistons, free of struts, 11.00-11.50.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
June Avg.	21.500	17.325	12.000	103.00	15.058	35.000	33.750	74.625
July 1-21	21.500	17.30–17.350	12.000	103.00	15.00-16.000	35.000	33.750	74.625
July 22-27	21.500	17.30–17.350	12.000	103.00	15.00-16.000	35.000	40.000	74.625
July 28-29	21.500	19.30–19.350	15.000	103.00	15.00-16.000	35.000	40.000	74.625

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$42.50-43.00*
No. 2 Heavy Melt. Steel	42.50-43.00*
No. 1 Busheling	42.50-43.00*
Nos. 1, 2 & 3 Bundles	42.50-43.00
Machine Shop Turnings	37.50-38.00
Mixed Borings, Turnings	38.00-38.50
Short Shovel Turnings.	39.50-40.00
Cast Iron Borings	38.50-39.00
Bar Crops and Plate	48.00-48.50
Low Phos. Steel	48.00-49.00
Heavy Turnings	39.50-40.00

Cast Iron Grades

No. 1 Cupola	63.00-64.00
Charging Box Cast	53.00-54.00
Heavy Breakable Cast.	56.00-58.00
Unstripped Motor Blocks	52.00-53.00
Malleable	69.00-70.00
Brake Shoe	55.50-56.00
Clean Auto Cast	58.00-59.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.50-44.00
R.R. Malleable	75.00-80.00
Axles	51.50-52.00
Rails, Rerolling	56.00-58.00
Rails, Random Lengths	54.00-56.00
Rails, 3 ft and under	60.00-60.50
Rails, 18 in. and under	62.50-63.50
Railroad Specialties	55.50-56.50
Uncut Tires	52.00-52.50
Angles, Splice Bars	53.00-54.00

* Plus applicable freight springboard.

CLEVELAND

No. 1 Heavy Melt. Steel	$42.00-42.50*
No. 2 Heavy Melt. Steel	42.00-42.50*
No. 1 Busheling	42.00-42.50*
Nos. 1 & 2 Bundles	42.00-42.50*
Machine Shop Turnings	37.00-37.50
Mixed Borings, Turnings	36.50-38.50
Short Shovel Turnings.	38.00-38.50
Cast Iron Borings	38.00-38.50
Bar Crops and Plate	47.00-47.50
Punchings & Plate Scrap	47.00-47.50
Heavy Turnings	42.00-43.00
Alloy Free Turnings	40.00-41.00
Cut Structurals	48.50-51.50

Cast Iron Grades

No. 1 Cupola	67.00-69.00
Charging Box Cast	58.00-60.00
Stove Plate	58.00-60.00
Heavy Breakable Cast.	54.00-56.00
Unstripped Motor Blocks	58.00-60.00
Malleable	73.00-75.00
Brake Shoes	52.00-53.00
Clean Auto Cast	68.00-70.00
No. 1 Wheels	58.00-60.00
Burnt Cast	56.00-57.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00*
R.R. Malleable	73.00-75.00
Rails, Rerolling	57.00-58.00
Rails, Random Lengths	56.00-57.00
Rails, 3 ft and under	60.00-61.00
Cast Steel	56.00-58.00
Railroad Specialties	53.00-55.00
Uncut Tires	51.00-53.00
Angles, Splice Bars	57.00-58.00

* Plus applicable freight springboard.

VALLEY

No. 1 Heavy Melt. Steel	$42.50-43.00*
No. 2 Heavy Melt. Steel	42.50-43.00
No. 1 Bundles	42.50-43.00
Machine Shop Turnings	37.00-39.00
Short Shovel Turnings.	39.00-39.50
Cast Iron Borings	38.50-39.00
Low Phos.	48.50-50.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00*

* Plus applicable freight springboard.

MANSFIELD

Machine Shop Turnings	$37.50-38.00
Short Shovel Turnings.	39.50-40.00

CINCINNATI

No. 1 Heavy Melt. Steel	$42.00
No. 2 Heavy Melt. Steel	42.00
No. 1 Busheling	42.00
Nos. 1 & 2 Bundles	42.00
Machine Shop Turnings	36.00
Mixed Borings, Turnings	36.00
Short Shovel Turnings.	38.00
Cast Iron Borings	37.00

Cast Iron Grades

No. 1 Cupola Cast	57.00
Charging Box Cast	45.00
Heavy Breakable Cast.	56.00
Stove Plate	50.00
Unstripped Motor Blocks	50.00
Brake Shoes	48.00
Clean Auto Cast	57.00
Drop Broken Cast	65.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00
R.R. Malleable	70.00
Rails, Rerolling	55.00
Rails, Random Lengths	54.00
Rails, 18 in. and under	61.00

DETROIT

(Brokers' buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$37.50-38.00
No. 1 Busheling	37.50-38.00
Nos. 1 & 2 Bundles	37.50-38.00
No. 3 Bundles	37.50-38.00
Machine Shop Turning	31.50-32.00
Mixed Borings, Turnings	31.50-32.00
Short Shovel Turnings.	32.50-33.00
Cast Iron Borings	32.50-33.00
Punchings & Plate Scrap	42.50-43.00

Cast Iron Grades

No. 1 Cupola Cast	53.00-58.00
Heavy Breakable Cast.	47.00-52.00
Clean Auto Cast	53.00-58.00

BUFFALO

No. 1 Heavy Melt. Steel	$44.75-46.25
No. 2 Heavy Melt. Steel	41.75-42.25
No. 1 Busheling	41.75-42.25
No. 1 & 2 Bundles	41.75-42.25
Machine Shop Turnings	34.75-35.25
Mixed Borings, Turnings	34.75-35.25
Cast Iron Borings	35.50-36.00
Short Shovel Turnings.	35.50-36.00
Low Phos.	44.75-45.25

Cast Iron Grades

No. 1 Cupola	60.00-65.00
Mixed Cupola	55.00-60.00
Heavy Breakable Cast.	55.00-57.00
Malleable	70.00-75.00
Clean Auto Cast	62.00-64.00

Railroad Scrap

Rails, 3 ft. and under.	60.00-61.00
Railroad Specialties	51.00-53.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$45.00-46.00
No. 2 Heavy Melt. Steel	41.50
No. 1 Busheling	41.50
Nos. 1 & 2 Bundles	41.50
No. 3 Bundles	39.50
Machine Shop Turnings	35.00
Mixed Borings, Turnings	35.00
Short Shovel Turnings.	35.00
Bar Crop and Plate	50.00-51.00
Punchings & Plate Scrap	50.00-51.00
Cut Structurals	48.50-49.00
Elec. Furnace Bundles	46.00-47.00
Heavy Turnings	44.50-45.00
No. 1 Chemical Borings	42.00-43.00

Cast Iron Grades

No. 1 Cupola Cast	63.00-65.00
No. 1 Machinery Cast.	67.00-68.00
Charging Box Cast	63.00-64.00
Heavy Breakable Cast.	63.00-64.00
Unstripped Motor Blocks	59.50
Malleable	76.00-78.00
Clean Auto Cast	64.00-65.00
No. 1 Wheels	68.00-70.00

NEW YORK

(Brokers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$39.00
No. 2 Heavy Melt. Steel	39.00
No. 1 Busheling	37.00
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	35.00
Machine Shop Turnings	31.00-31.50
Mixed Borings, Turnings	28.50-29.00
Short Shovel Turnings.	33.00-33.50
Punchings & Plate Scrap	42.00-42.50
Cut Structurals	42.00-42.50
Elec. Furnace Bundles.	42.00-42.50

Cast Iron Grades

No. 1 Cupola Cast	57.00-58.00
Charging Box Cast	56.00-58.00
Heavy Breakable	56.00-58.00
Unstripped Motor Blocks	52.50-53.50
Malleable	68.00-69.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$34.40-36.40
No. 2 Heavy Melt. Steel	34.40-36.40
No. 1 Bundles	34.40-36.40
No. 1 Busheling	34.40-36.40
Machine Shop Turnings	29.40
Mixed Borings, Turnings	29.40
Short Shovel Turnings.	31.40
Bar Crops and Plate	35.00-37.00
Punchings & Plate Scrap	35.00-37.00
Chemical Borings	33.00

Cast Iron Grades

No. 1 Cupola Cast	58.00-60.00
Heavy Breakable Cast.	53.00
Stove Plate	52.00-54.00
Unstripped Motor Blocks	48.00-50.00
Clean Auto Cast	50.00-52.00

CHICAGO

No. 1 Heavy Melt. Steel	$41.50-42.00
No. 2 Heavy Melt. Steel	41.50-42.00
No. 1 Bundles	41.50-42.00
No. 2 Bundles	41.50-42.00
No. 3 Bundles	39.50-40.00
Machine Shop Turnings	36.50-37.00
Mixed Borings, Turnings	36.50-37.00
Short Shovel Turnings.	38.50-39.00
Cast Iron Borings	37.50-38.00
Bar Crops and Plate	47.00-48.00
Punchings	48.00-49.00
Elec. Furnace Bundles.	42.50-43.00
Heavy Turnings	41.00-41.50
Cut Structurals	46.50-47.00

Cast Iron Grades

No. 1 Cupola Cast	69.00-71.00
Clean Auto Cast	69.00-71.00
No. 1 Wheels	62.00-63.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	47.00-48.00
Malleable	78.00-79.00
Rails, Rerolling	62.00-63.00
Rails, Random Lengths	54.00-55.00
Rails, 3 ft and under	59.00-60.00
Rails, 18 in. and under	60.00-61.00
Railroad Specialties	54.00-55.00
Angles, Splice Bars	55.00-56.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$42.50-43.50
No. 2 Heavy Melt. Steel	40.00-41.00
Machine Shop Turnings	32.50-33.50
Short Shovel Turnings.	34.50-35.50

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	65.00-67.00
Mixed Cast	56.00-58.00
Heavy Breakable Cast.	59.00-60.00
Brake Shoes	58.00-59.00
Clean Auto Cast	65.00-67.00
Burnt Cast	59.00-60.00

Railroad Scrap

R.R. Malleable	69.00-70.00
Rails, Rerolling	57.00-60.00
Rails, Random Lengths	50.00-51.00
Rails, 3 ft and under	58.00-60.00
Uncut Tires	49.00-50.00
Angles, Splice Bars	50.00-52.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$37.50
No. 2 Heavy Melt. Steel	37.50
No. 1 Busheling	37.50
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	35.00
Long Turnings	24.50
Short Shovel Turnings.	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	49.00
Cut Structurals	48.50

Cast Iron Grades

No. 1 Cupola Cast	63.00
Stove Plate	60.00-62.00
No. 1 Wheels	59.00-61.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	nom.
Axles, Steel	50.00
Rails, Rerolling	53.00-55.00
Rails, Random Lengths	45.00-48.00
Rails, 3 ft and under	53.00-55.00
Angles and Splice Bars	52.00-53.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$25.00
No. 2 Heavy Melt. Steel	*25.00
No. 1 Busheling	*25.00
Nos. 1 & 2 Bundles	*25.00
No. 3 Bundles	*19.00
Machine Shop Turnings	*15.50
Bar Crops and Plate	25.00
Cast Steel	25.00
Alloy Free Turnings	15.50
Cut Structurals	25.00
Tin Can Bundles	19.00

Railroad Scrap

No. 1 Heavy Melting	26.00
Axles	32.00
Rails, Random Lengths	26.50
Uncut Tires	33.50

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$26.00
No. 2 Heavy Melt. Steel	26.00
No. 1 Busheling	26.00
Nos. 1 & 2 Bundles	22.00-23.00
No. 3 Bundles	22.00-23.00
Machine Shop Turnings	19.00-21.00
Mixed Borings, Turnings	19.00-21.00
Punchings & Plate Scrap	26.00-28.00
Cut Structurals	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	40.00
Heavy Breakable Cast.	35.00
Stove Plate	30.00
Unstripped Motor Blocks	32.50
Malleable	40.00
Brake Shoes	35.00
Clean Auto Cast	40.00
No. 1 Wheels	35.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Railroad Malleable	30.00
Rails, Random Lengths	21.50
Angles and Splice Bars	23.00

LOS ANGELES

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	25.00
Nos. 1 & 2 Bundles	25.00
Machine Shop Turnings	16.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	28.00
Elec. Furnace Bundles.	28.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00

HAMILTON, ONT.

(Ceiling prices, delivered)

Heavy Melt.	$22.00
No. 1 Bundles	22.00
Mechanical Bundles	20.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	28.00
Rails, Rerolling	26.00
Bushelings	17.00
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	42.00-48.00
No. 2 Cast	35.00-37.00

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.

For High Density Bales...use the Self-Contained

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Both two and three ram models are available with automatic controls . . . and are recommended when the nature of the scrap warrants such application and where high output is desired.

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Pioneers in the metal baling field, LOGEMANN engineers have embodied the features proved through actual operation to be essential to constant, uninterrupted service. These same engineers are prepared to offer suggestions as to operating layout and installation of any unusual or specific need. Present your problem to them, stating the nature of your scrap and the tonnage desired. There is no obligation.

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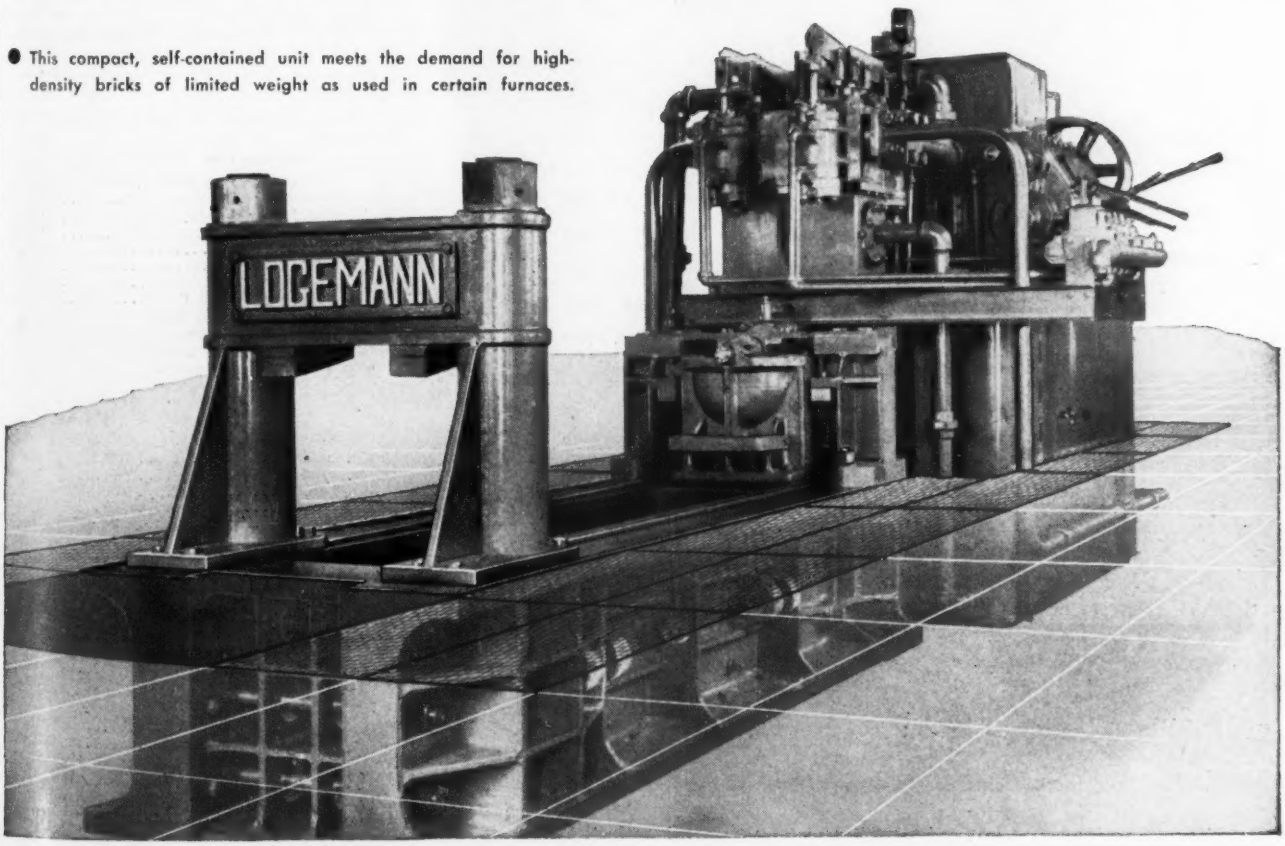

Bethlehem Revises Prices

Philadelphia — To meet competition in certain products, Bethlehem Steel Co. last week reduced prices on a substantial list of selected items $1 to $3 a ton, as of July 28. This followed a general increase the week before, with the newly adjusted price schedules still well above what they were originally.

As a result of the latest change, hot-rolled sheets are down $1 a ton to 3.25c, Sparrows Point and Lackawanna; cold-rolled sheets, $2 a ton to 4.40c, Sparrows Point and Lackawanna; galvanized sheets, $2 a ton to 4.40c, Sparrows Point; hot strip, $1 a ton to 3.25c, Sparrows Point and Lackawanna; cold rolled strip, $2 a ton to 4.00c, Sparrows Point and Lackawanna; galvanized copper bearing culvert, $3 a ton, to 5.00c, Sparrows Point.

Mayari R hot rolled sheets, 72 inches and narrower, are down $2 a ton to 4.95c, Lackawanna; Mayari R hot rolled sheets, 60 inches and narrower, $2 a ton, to 4.95c, Sparrows Point; Mayari R cold rolled sheets, 13 gage and thinner, 60 inches and narrower, $2, to 6.05c, Lackawanna; Mayari R cold rolled sheets, 14 gage and thinner, 48 inches and narrower, $2 a ton, to 6.05c, Sparrows Point; Mayari 4 galvanized sheets, 10 gage base, 48 inches and narrower, $2 a ton, to 6.75c, Sparrows Point; Mayari R hot rolled strip, produced on sheet mill, $2 a ton, to 4.95c, Sparrows Point and Lackawanna; Mayari R cold rolled strip, produced on sheet mill, $2 a ton, to 6.05c, Lackawanna and Sparrows Point.

Rails, over 60 pounds per yard, are down $1 a ton to 3.20c, Steelton, Lackawanna and Sparrows Point; rails, 60 pounds and under, $1 a ton to 3.55c, Johnstown and Lackawanna; tie plates, $2 a ton, to 4.05c, Steelton and Lackawanna; joint bars, $2 a ton to 4.25c, Steelton and Lackawanna.

Carbon bars AEXX were reduced $1 to 3.35c, Johnstown and Lackawanna; reinforcing bars, $1 a ton to 3.35c, Johnstown, Lackawanna and Sparrows Point; hot rolled alloy bars, $2 a ton to 3.75c, Bethlehem, Johnstown and Lackawanna; hot rolled bars, open hearth, crucible analysis, $1 a ton to 5.50c.

Hot rolled alloy bars, except Mayari R, down $2 a ton, to 3.75c, Bethlehem, Lackawanna and Johnstown; hot rolled Mayari R bars and small shapes, $2 a ton, to 5.10c, Bethlehem, Lackawanna and Johnstown. Forged steel axles are down $1 to 5.20c Johnstown.

An HD-3636 Vertical Retort Furnace in one of the largest Aircraft Engine Research Laboratories.

IN one of the country's largest Aircraft Engine Research Laboratories a Hevi Duty 3636 Vertical Retort Electric Furnace is used for heat treating test parts for aircraft engines. This furnace, due to its unique construction with multiple zone temperature regulation and positive, flexible atmosphere control for the parts being run, lends itself particularly to the work the laboratory is called upon to produce. Carburizing, Nitriding, Bright Annealing and Clean Hardening can be readily handled.

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Fastener Prices Advance

Cleveland — A leading producer here has announced an increase on all fasteners of about 15 per cent effective as of Aug. 1. The upward price revision is on account of increased costs of raw materials and labor experienced during the past several weeks. The advance applies on bolts, nuts, rivets, wood screws, machine screws, cap screws and sheet metal screws.

It is interesting to note that the recent change in steel pricing to an f.o.b. mill basis means an added overall freight cost of $4 a ton to this Cleveland producer since approximately 70 per cent of the steel tonnage used is produced outside of that district.

This producer is now quoting as follows:

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	35 off
⅞ and ⅝ x 6-in. and shorter	37 off
¾-in. and larger x 6-in. and shorter	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

Stove Bolts

In packages, nuts separate, 70-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅞-in. and smaller	41 off	.....
½-in. and smaller	.....	38 off
½-in.-1-in.	39 off	.....
⅞-in.-1-in.	.....	37 off
1⅛-in.-1½-in.	37 off	35 off
1⅝-in. and larger	.....	28 off

Additional discount of 15 for full containers.

Hexagon Cap Screws
(Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated)	
⅝ and smaller x 6 and shorter	40 off
¾, ⅞, & 1 x 6 and shorter	35 off

Square Head Set Screws

Upset 1-in. and smaller	51 off
Headless, ¼-in. and larger	31 off

Champion Rivet Co., this city, has increased the price of structural rivets, 1/2-inch and larger, to 6.75c from 5.65c.

Republic Raises Steel Prices

Cleveland—Republic Steel Corp. issued its new price schedule last week, establishing prices at its mills at the same levels as those issued by Carnegie-Illinois Steel Corp. on products produced by both. On products not quoted by Carnegie, Republic now quotes: $76 per net ton on tube rounds; $4.65 per 100 pounds on cold-finished alloy steel bars; $5.10, oven lining sheets; $5.15, Paintlok and Zincbond sheets; $4.15, low-carbon manufacturers' wire; $4.80, merchant quality annealed wire; $5.25, merchant quality galvanized wire; $5.20, standard, high-carbon, upholsterers' spring wire; $5.55, M. B. high-carbon spring wire; $4, cold-finished carbon bars. Standard nails and staples are quoted Column 103.

Sheets, Strip . . .

Sheet Prices, Page 132

Pittsburgh — Wheeling Steel Corp. has established hot-rolled sheet prices at $3.25 and cold-rolled sheets at $4 per 100 pounds, Steubenville Works; galvanized sheets at $4.40 at its Martins Ferry and Steubenville plants. Company increased standard and seamless pipe $10 a ton at its Benwood, W. Va., plant. Follansbee Steel Corp. is quoting cold-rolled sheet and strip at Follansbee, W. Va., plant at $4. Company has also advanced electrical sheets in line with those prices quoted by Carnegie.

Increase of 3 cents to 15 cents per pound, E. St. Louis, for prime western zinc last week automatically forces an increase in galvanized sheet prices since coating extras are established on a sliding scale based on 5 cent zinc. In the galvanized sheet gage range of 24 to 27 inclusive, the three-cent increase in zinc prices will raise the coating extra from 53 cents to 75 cents per 100 pounds. Advance in lead price of 2 cents to 19½ cents per pound, New York, also is expected to increase production cost in the manufacture of long ternes, roofing ternes and manufacturing ternes.

Price range of $3.25 to $3.30 per 100 pounds prevails on hot-rolled sheets and strip among producers in the Pittsburgh district. Allegheny-Ludlum Steel Corp. has not taken any price action as yet on electrical sheets. This company in the past has been quoting substantially higher prices than other producers.

Allegheny-Ludlum Steel Corp. has raised silicon sheet prices an average of $10 a ton to the following levels: Motor, 7.20c a pound; Dynamo, 7.90c; transformer, 72, 8.90c; 65, 9.60c.

Boston — Few steel users have digested new higher prices and mill basing points to the extent they have a clear, concrete estimate of costs or the impact of these changes in the near future. Emphasis is on availability of steel and reaction to above factors is slight. Excess of demand over supply tends to obscure the long-run effect of mill pricing and it will be some time, probably months, before wide shifts in distribution are likely. As to carbon sheets, including galvanized, Bethlehem Steel Co. can charge $1 to $2 a ton higher at the mill levels and still deliver to most New England points at the lowest price. This holds for most other steel products rolled at Bethlehem mills. Cold strip producers have followed the advance in that commodity, but not uniformly in all cases. One at Worcester and Mattapan meets the New Haven base, 4.50c with 0.40-0.60 carbon priced at 5.80c and 0.60-0.80 carbon at 6.40c; new size extras are also applicable. Most cold strip sold has been taking some form of extra and the over-hauling given extra cards a year or more ago, will have renewed impact at the higher price levels.

New York—As a result of further price revisions by Bethlehem Steel Co., the largest changes involve $1 and $2 reductions on sheet and strip, and $3 in galvanized culvert. Minimum delivered prices here on hot rolled sheets, 60 inches and narrower, are 3.63c from Sparrows Point, and 72 inches and narrower, 3.78c from Lackawanna. Cold rolled sheets, 48 inches and narrower and 11 gage and thinner, are 4.38c from Sparrows Point; and 72 inches and narrower and 11 gage and thinner, 4.57 to 4.53c from Lackawanna. Galvanized sheets, 10 gage and 48 inches and narrower, 4.78c from Sparrows Point and galvanized culvert, 16 gage, 5.38c from Sparrows Point.

Minimum delivered price on hot rolled strip, produced on sheet mill, is 3.63c, from Sparrows Point; also hot strip is 3.78c from Lackawanna and 3.81c from Pittsburgh. Cold rolled strip from Sparrows Point is

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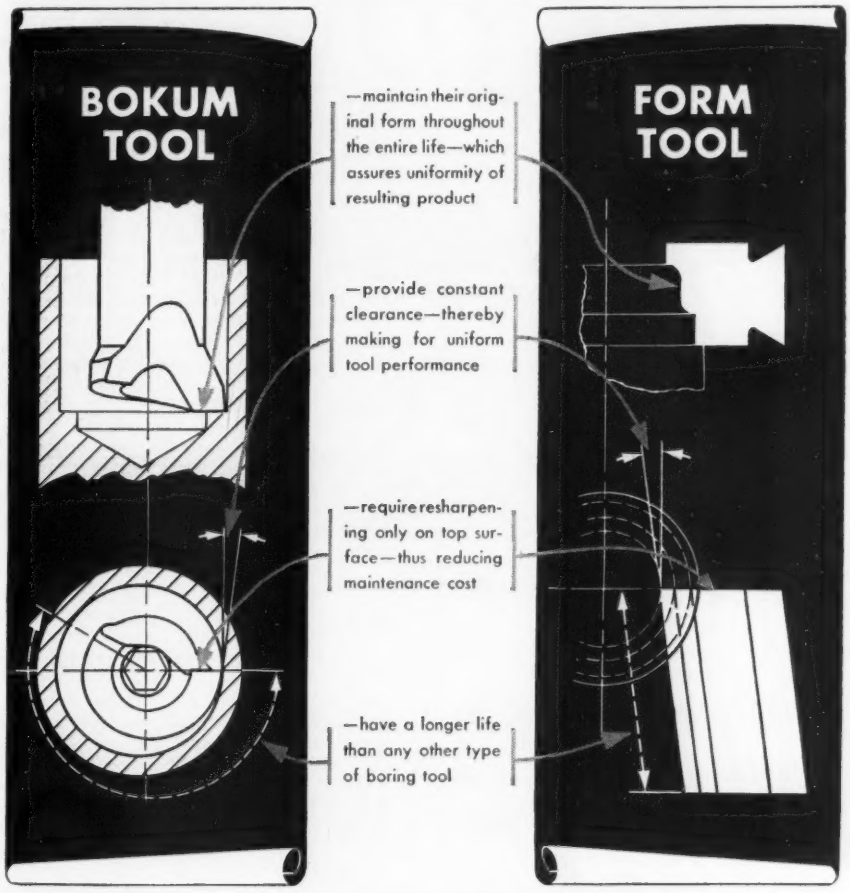
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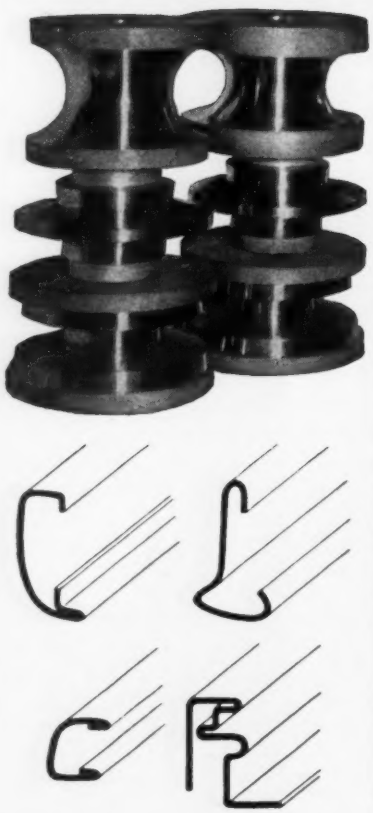

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4.38c. An early advance in stainless sheet prices is expected particularly in view of the recent advance in the price of nickel.

Philadelphia — Reductions by the leading eastern producer of sheets and strip, has placed minimum delivered prices here at 3.51c for hot rolled carbon sheets, 60 inches and narrower; 3.25c Sparrows Point plus .26c freight, 4.26c for cold rolled carbon sheets, 48 inches and narrower, 14 gage and thinner, 4.00c Sparrows Point; 4.66c for galvanized 4.40c Sparrows Point; 3.51c for hot carbon strip, produced on sheet mill, 3.25c Sparrows Point; and 4.26c for cold carbon strip, produced on sheet mill, 4.00c Sparrows Point.

The Conshohocken, Pa., producer has advanced hot carbon sheets to 5.00c, mill, making for a delivered Philadelphia price of 5.08c. This interest has also advanced its Dynalloy sheets, 14 gage and heavier, to 5.25c.

Some leading sheet sellers are planning to set up fourth quarter quotas by the middle of August, with tonnage under voluntary allocation program expected to make heavier inroads into general consumer quotas than heretofore.

Chicago — So far as can be determined, consumers of flat-rolled continue to seek and specify material according to the established pattern, this despite the fact that it would be more economical to acquire supplies at the closest mill. Shifting of mill connections under the f.o.b. mill pricing system is not likely to come until supply of steel exceeds demand, and this point does not loom in the near future. Manufacturers of pails and containers report a quickening in sales and operation have been increased, although the latter still are limited by steel supply.

Birmingham — Considerable emphasis is being put on production of sheets in this district since demand remains at a continuously high level. Sheet users have pretty well adjusted themselves to the current supply situation, but they do so only at the expense of curtailed production.

St. Louis — Granite City Steel Co., chief producer of sheets and other flat steel products in this district, has announced price increases ranging from $8 to $11 on some, although not all, items. Cold-rolled sheets, galvanized sheets and enameling iron were raised $11, and electrical sheets and culverts $8. Price of tin mill products will remain unchanged temporarily, although the company predicted those may go up $2 soon. The mill is now on an f.o.b. base on all products except tin mill products, which officials say have been on a "practically f.o.b." basis the last two years for the reason most of its tin products go to consumers in the St. Louis area.

Sheet production in this district is improving somewhat, with Granite City Steel's new cold mill picking up speed as adjustments progress in auxiliary equipment. Company officials predict a 20,000-ton monthly rate will be reached by fall.

Steelmakers report no easing in heavy sheet demand. On the contrary, nationwide abandonment of the basing point pricing system is deluging them with inquiries as purchasing agents everywhere scout for cheaper sources of supply.

Tubular Goods . . .

Tubular Goods Prices, Page 133

Pittsburgh — A number of additional pipe producers announced higher price schedules recently and notified their customers that prices would be based f.o.b. producing point. Price increases announced to date amount to $10 per ton on butt weld standard and line pipe and seamless, both black and galvanized. Drill pipe has been increased $8 per net ton; oil country casing, $10; and oil well tubing, $11 and $15. Hot and cold drawn seamless boiler tube prices have been increased an average of 9.5 per cent.

Pittsburgh Steel Co. revised its prices effective July 23, f.o.b. Allenport, Pa., as follows: All grades of oil country casing up $10 per net ton; oil well tubing, H-40, J-55, and N-80 was also advanced $10; drill pipe increased $4 net ton. All quantity extras for tubular specialties, Schedules A and D, were increased 7½ points; all quantity deductions reduced 7½ points. Analyses extras for tubular specialties, Schedule B-2, were advanced 8½ points; all analyses deductions reduced 8½ points. The above on B-2 schedule applies only on analyses under 5 per cent chrome. All analyses extras applicable to Schedules B-3 and J were raised 8½ points; all analyses deductions reduced 8½ points. This applies on all grades on B-3 and J schedules. No price revisions were announced for Schedules K and M.

Spang-Chalfant Division of National Supply Co. raised its prices effective July 22. All welded pipe items in the future will be based at its plant in Etna, Pa., seamless pipe items at Ambridge, Pa. Company raised 1/8-inch standard pipe $6 a ton; 1/4 and 3/8-inch standard, $10 a ton. Standard butt weld pipe, 1/2 to 3 in., black and galvanized, was increased $10. Seamless oil country casing, J-55 and H-40, advanced $10; oil country tubing, J-55 and H-40, up $11; N-80 casing and tubing advanced $15. All other seamless tubular products were increased $10.

National Tube Co.'s new prices on standard butt weld black and galvanized, 1/2 to 3-inches; seamless black and galvanized; and butt weld and seamless line pipe were all advanced $10 a net ton and are based at company's plant at Lorain, O. Advances in oil country tubular goods published in July 26 issue are based company's plant at McKeesport, Pa. National Tube will continue to sell standard and extra strong butt weld pipe in sizes 1/8, 1/4 and 3/8-inch, under long standing agreement with Fretz-Moon Tube Co., based at plant, Butler, Pa.

Increase in prices announced by National Tube Co. represent a reduction of 5 points in the discount card on standard butt weld and seamless, also butt weld and seamless line pipe. The new prices for seamless boiler tubes represent an increase of 9.5 per cent in quantity extras.

National Tube Co.'s boiler tube prices are based at its Ellwood City, Pa., plant for size ranges 2-1/4-in. o.d. 12 gage through to 6-in. 7 gage for hot-rolled; and from 1 in. o.d. 13 gage through 6-in. 7 gage on cold drawn. Company does not produce hot-rolled boiler tubes at its Gary

Works but has established similar prices for cold drawn within the size range 2 inches and under 14 gage and lighter.

A. M. Byers Co. raised its prices on wrought iron pipe 9 per cent, effective July 22. This advance represents average revision in discounts for butt and lap weld, black and galvanized pipe of 8-1/2 points. These discounts are based on carload lots.

Boston — Merchant steel pipe distributors are selling f.o.b. warehouse, the consumer paying delivery charges to destination. Thus, the consumer assumes, not only sharp increase in mill rates, but also a double-barreled freight in most instances. One producer is placing electric welded on the same price basis as seamless; electric welded has been $1 ton lower. Among larger sellers of standard pipe there is a spread of $1.80 a ton, delivered Boston; while recent advances were more or less uniform, this spread results from an earlier increase of $4 a ton by one mill.

St. Louis — Pipe demand continues unremitting, with mills booked through the fourth quarter and not planning to accept new business before next year. Jobbers are insistent on deliveries for commercial and residential construction. Producers here are running into the common difficulty of having more steel-rolling than steel-producing capacity. A scarcity of rerolling rails also is hitting output of concrete bars. Heaviest pipe demand is for half-inch, three-quarter inch, one inch and one and a quarter inch sizes.

Steel Bars . . .

Bar Prices, Page 132

New York — Minimum delivered price here on hot rolled bars is 3.84c, based on a revised price of 3.35c and a .49c freight rate from Johnstown. Pittsburgh is 3.91c, 3.35c mill plus .56c freight.

New billet reinforcing bars delivered here are now 3.73c from Sparrows Point, 3.84c from Johnstown, 3.88c from Lackawanna and 3.91c from Pittsburgh.

Various producers of cold finished bars have established mill prices of 4.40c at Newark, N. J., Putnam, Conn., Hartford, Conn., and Mansfield, Mass.; 4.45c Camden, N. J.; 4.00c Beaver Falls, Pa., and Massillon, O.; and 3.95c Pittsburgh. One eastern Pennsylvania cold drawer had not as yet announced a change, as this issue went to press.

Boston — Although the mill price is higher, $1 per ton on hot-rolled carbon bars and $2 on hot-rolled alloys, Buffalo and Bethlehem, Pa., mills can deliver to most New England points at the lowest price, 3.97c and 4.33c, Boston, respectively. The Hartford, Conn., mill base is 4.40c on cold-finished carbon and 4.95c on alloys, the latter equaling Worcester, where the differential is $6 a ton higher than Cleveland, Waukegan and Donora. There are several cold-finishing mills at other points in this area, all dependent on hot mills for bars, adjusting upward; Hartford is the largest producer of cold-drawn carbon. Within the limits of capacity, which

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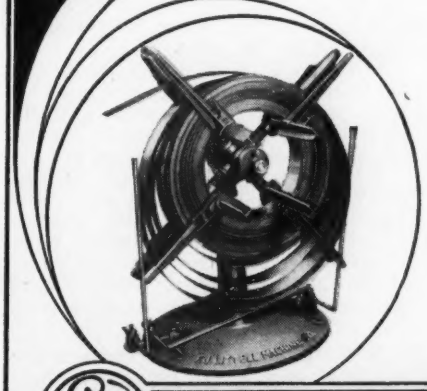

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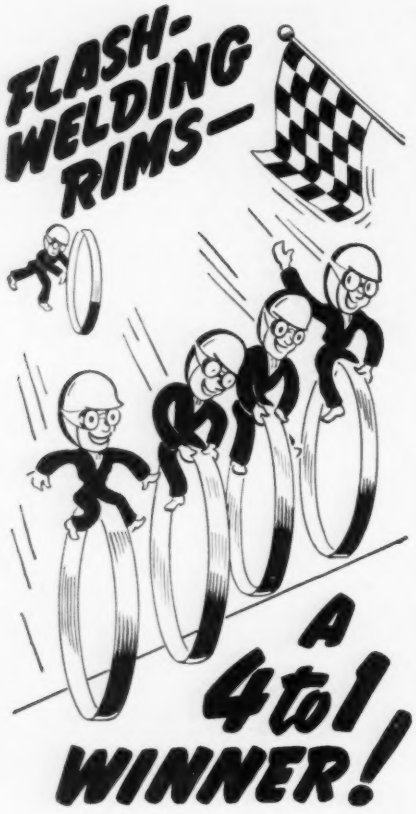

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is substantially under total requirements, the cold drawn bar market will be normally competitive. One large producer is going on allocation of cold finished flats after fourth quarter.

Philadelphia—Based on the new 3.35c, Johnstown price, which is $1 a ton down from the preceding week, minimum Philadelphia delivered price on hot carbon bars is 3.79c, the freight amounting to .44c. Minimum delivered price here on new billet reinforcing bars is now 3.51c, this reflecting a drop of $1 a ton at Sparrows Point to a mill price of 3.35c. This price was also set up at Johnstown and Lackawanna by the same producer, representing a drop of $1 a ton.

Cold finished alloy bars have been established at 4.65c, Bethlehem and Lackawanna.

Pittsburgh — Pittsburgh Steel Co. established the following prices at its Monessen, Pa., mill, effective July 26: Hot-rolled merchant bars, $3.55 per 100 pounds; hot-rolled concrete bars, $3.55; cold-finished carbon bars, $4.25; cold-finished alloy bars, $4.75.

Wyckoff Steel Co. has established mill price on carbon cold-finished bars of $4 per 100 pounds at Ambridge, Pa., and Chicago; and $4.40 per 100 pounds at Newark, N. J., and Putnam, Conn.

Columbia Steel Co. has advanced cold-finished carbon bars to $4 per 100 pounds at its Carnegie, Pa., plant.

Wire . . .

Wire Prices, Page 133

Boston — Nonintegrated wire mills, confronted with the $12 per ton increase in rod costs, are adjusting finished wire prices accordingly, but not uniformly, depending on source of supply, freights and other rising charges. Carbon rods drawn at Johnstown, Pa., 3.40c mill, can be delivered Boston, at 4.04c and from Sparrows Point, not resulphurized, 3.50c mill, at 4.06c; this compares with 3.70c, carbon rods, Worcester. While the Bethlehem-Johnstown mill is 4.15c for manufacturers' wire, same as Cleveland and Donora, price at Sparrows Point is 4.25c. Worcester is 4.45c. On other common grades, the same pattern holds with Johnstown meeting the larger mill basing points and Sparrows Point $2 a ton higher. One Worcester mill is quoting 5.75c on flat wire.

Pittsburgh—Portsmouth Steel Co. has raised the price of wire rods to $4.10 per 100 pounds, Portsmouth, O., mill; bright basic wire, $4.70; M. B. spring, $5.55, nails to column 117.

Pittsburgh Steel Co. is quoting $4.15 on wire rods, $4.50 on bright manufacturers' wire, $4.95 on annealed merchant quality wire; $5.40 on galvanized merchant quality wire; $5.65 on M. B. spring wire; $5 on flat wire. All prices are at Monessen, Pa., mill.

Birmingham — Wire products for the most part are in little or no better supply than ever. Some easing in nails is reported, although manufacturers' wire and much of the variety used in agriculture is still scarce. Demand for fencing continues heavy.

Timken Makes Price Chamge

Canton, O.—Adjustments in prices of certain products of Steel & Tube Division, Timken Roller Bearing Co., were announced effective on shipments July 28. Base price of alloy steel products will be as follows: Alloy steel blooms, billets and slabs $63 per net ton, alloy steel bars (hot rolled) $3.75 per hundred pounds, in addition alloy extras will apply on a net ton basis on blooms, billets and slabs.

Tubing for antifriction bearing races, all grades, has been increased approximately 3 per cent over current prices, and alloy mechanical tubing 4 per cent. Price rises on other grades of seamless tubing range from 4 to 11½ per cent.

Tool Steels . . .

Tool Steel Prices, Page 133

Pittsburgh — Latrobe Electric Steel Co., Latrobe, Pa., is the first tool steel producer to advance its prices, with others soon expected to follow. The increase amounts to 10 per cent on base prices and extras on high-speed, tool die and carbon tool steels, effective as of July 27.

Plates . . .

Plate Prices, Page 133

New York — Leading eastern plate sellers have now completed their latest price adjustments. The last to act is the Alan Wood Steel Co., which has stepped up carbon plates to 3.95c, f.o.b. plant, floor plate to 4.45c and Dynalloy plates 5.30c. Delivered prices here from the leading eastern producing points are now 3.83c from Sparrows Point, Md., 4.06c from Coatesville, Pa., 4.24c from Conshohocken, Pa., 4.25c from Claymont, Del., and 6.21c from Harrisburg, Pa.

Demand, meanwhile, continues well in excess of supply, with producers able to dispose of their tonnage regardless of price.

Boston — The increase in plate costs has not narrowed price spreads which cover the lowest, 4.01c and 4.02c, Sparrows Point and Buffalo, carbon plates to upwards of $30 per ton higher for some of the eastern Pennsylvania independents. Although the mill price is $1 a ton lower at Pittsburgh, a 67-cent freight brings the delivered Boston price to 4.07c.

Demand for plates is far in excess of supply and there is no slackening in demand because of price. While most mills are discouraging the use of substitutes, some high tensile material is going into fabricated work which ordinarily would be straight carbon. Worst pinch continues in light gage stock. With allocations reduced this quarter, most fabricators and distributors are doubtful full restorations will be possible for the final quarter.

Philadelphia — Minimum delivered price on carbon plates is 3.71c, reflecting a 3.45c mill price at Sparrows Point, plus .26c freight. Delivered prices from other mills include 3.89c from Coatesville, 4.03c from Claymont and Conshohocken, and 6.15c from Harrisburg. Pittsburgh delivered price here is 3.89c, the same

as from Coatesville.

Conshohocken producer has established floor plate at 4.55c mill, making for a delivered price here of 4.63c, against a delivered price from Pittsburgh of 5.04c.

Birmingham — Plate demand continues strong and in excess of supplies as has been the case for many months. Structural shops are short on inventories in most instances, but such needs as car building and tank production are pretty well taken care of. Miscellaneous users of sheets in relatively small lots take their luck in warehouse purchases.

Structural Shapes . . .

Structural Shape Prices, Page 133

New York—Structural buying recently has been light, although substantial tonnage has been pending and fabricators in general have backlogs averaging around five months. Certain of the larger shops are now out of the market for the entire year. The sharp increase in steel prices, due not only to advances in the mills' prices but in a number of cases to higher freight rate resulting from the shift of steel producers to shipping point pricing system, is causing some builders to hold up on work, pending a refiguring of costs. In certain instances, work likely will not go ahead at all.

Philadelphia — Structural demand is easing, but how much of this may be due to refiguring as a result of higher steel prices and higher freight rates because of the shift to the mill pricing system is difficult to estimate.

Boston — Most fabricated structural work up for estimates is wanted on a basis of delivery and contracts are closed frequently with delivery the main factor. Some shops are taking tonnage without assurance of plain material, hoping to piece out requirements from spot mill shipments and from stock. As supply is limited and uncertain in both directions, delays and confusion increase. The increase in structural prices finds most private construction covered by escalator clauses; in estimating public requirements at firm prices, shops generally took the likelihood of higher costs into consideration.

For the largest project recently opened, superstructure, bridge, Housatonic river, Shelton-Derby, Conn., 3700 tons, American Bridge Co., Pittsburgh, was the only bidder.

Semifinished Steel . . .

Semifinished Prices, Page 132

Pittsburgh—The changeover from a $56 gross ton base price to a $51 net ton basis, established by Carnegie-Illinois Steel Corp. on alloy ingots, represents a $1 a net ton increase. Like adjustment in size and grade extras brings the aggregate advance in range of $3 to $4 on a net ton basis. Similarly the revision from a $66 gross ton basis of quoting alloy billets, blooms and slabs to a $63 net ton basis constitutes an advance of about $4 a net ton. As in case of ingots the applicable extras also have been adjusted to a net ton basis. Pittsburgh Crucible Steel Co. has followed Carnegie's price action in es-

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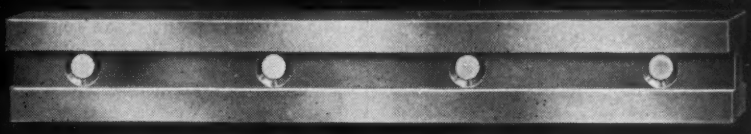

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tablishing a $63 net ton price for billets, blooms and slabs at its Midland, Pa., plant.

Recent sharp upturn in steel prices and indicated continued critical shortage of most items have combined to strengthen open market prices on ingots, sheet bars and other semifinished products. Rerolling ingots currently are reported purchased in open market within price range of $100 to $105, in contrast to previous range of $90 to $95. Negotiated deals involving sheet bars are within range of $110 to $115, against $95 to $105 formerly. Hot-rolled sheets are said to be moving at close to $250; cold rolled $280 a ton.

Increased activity in production of ingots for sale by steel foundries has been in evidence during recent weeks, reflecting in part the increased available melting capacity due to easing in demand for steel castings. Recent sale of Sterling Steel Foundry Co., Pittsburgh, to five refrigeration equipment manufacturers, is one example of increased activity in this connection. Another steel foundry here is making preparations to divert part of its capacity for production of ingots, and other deals are pending at Chicago and Buffalo. One interest in West Virginia is considering installation of at least one electric furnace.

Tin Plate . . .

Tin Plate Prices, Page 133

Pittsburgh — Weirton Steel Co. is the only producer in the Pittsburgh area that has announced mill price policy on tin plate. Similar action is expected momentarily by Carnegie, Jones & Laughlin, and Wheeling Steel. Bethlehem and Inland Steel are reported to have adopted producing point price policy on their tin mill products. Those tin plate producers that reduced prices last April have recently increased prices to former levels.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 134

Pittsburgh — Connellsville beehive coke operators have advanced prices $1 to $1.50 a net ton, retroactive to July 1. Higher cost of coal, advance in wages and other production cost factors forced latest price advance to a range of $13.50 to $15 for beehive furnace: $16 to $18 on foundry. Similar factors resulted in a $1 a net ton advance for New River beehive foundry coke to $16.50; Wise county foundry to $15.35, furnace to $14.60. Higher prices also are noted for oven foundry coke in other districts.

Chicago — Oven foundry coke was increased by Pickands, Mather & Co. by 90 cents a ton, to $20.40 f.o.b. ovens, effective July 23. The advance was expected to be general within a few days. Coke no longer is being quoted on a Chicago delivered basis, the arbitrary switching charge of $1.30 a ton heretofore utilized having been eliminated. Actual freight from ovens now is being charged.

Portsmouth, O.—Portsmouth Steel Corp., raised oven foundry coke prices at its local ovens $1 per net ton to $19.25.

Pig Iron . . .

Pig Iron Prices, Page 134

New York — With a $4 increase in effect at Bethlehem, Pa., minimum delivered prices on pig iron at Newark, N. J., are now $46.39 for basic, $46.89 for No. 2 foundry, $47.39 for malleable and $47.89 for bessemer; at Brooklyn, $48.40 for No. 2 foundry and $48.90 for malleable.

The Troy, N. Y., producer of low phosphorus has increased his price $4 to $50, f.o.b. furnace.

An increase by the Swedeland, Pa., producer is expected to be announced early in August or whenever it is ready to book shipments from its merchant stack, which is now undergoing repairs. Indications are that this stack will be blown in a few days before the middle of the month.

Boston — Through several agencies, pressure is being put on Washington for more pig iron for New England consumers during the next three months or while Mystic production is halted. Several furnaces also have been asked to divert more iron to this district. These efforts appear to be doubtful of success; so limited is supply, any tonnage diverted will be at expense of other consumers, also short of iron. A few shops with contracts covering housing may get some tonnage, but for most melters the outlook is dubious. With the increase in price of $4 a ton an upstate New York supplier from Troy and Buffalo, has removed the price tie-in with heavy melting steel scrap at Buffalo. This producer is supplying the bulk of basic melted at Phillipsdale, R. I., and Bridgeport, Conn.

Philadelphia—With the $4 advance at Bethlehem, Pa., minimum delivered Philadelphia prices are now $46.17 for basic, $46.67 for No. 2 foundry, $47.17 for malleable and $47.67 for bessemer. Local delivered price on low phosphorus is now $52.81, reflecting a $4 increase at Steelton, Pa., where increases of $4 a ton were also put into effect on the other four grades.

Swedeland, Pa.—Producer is expected to announce increases within the next two weeks. Meanwhile, Woodward Iron Co., Birmingham, has increased prices $4 a ton in line with action taken by other southern producers.

Pittsburgh — Carnegie - Illinois Steel Corp. has established the following Pittsburgh mill prices for the various grades of pig iron produced: Basic, $43 per gross ton; foundry and malleable, $43.50 a gross ton; bessemer, $44 per gross ton. The company also has further revised its pig iron prices at Chicago plants, which now represent an increase of $4.50 on basic and foundry grades, and $4 on malleable and bessemer. Initial price announcement indicated a $4 per ton across-the-board increase for all grades. Prices now are in line with those quoted at Pittsburgh furnaces and are the same as those announced by American Steel & Wire. Geneva Steel Co. has established a price of $43.50 for No. 2 foundry, f.o.b. Geneva.

On July 21 last Carnegie also advanced spiegeleisen (19-21 per cent Mn 1-3 per cent Si.) $5 per gross ton to $56, carlots, producing points.

Company also has established price of $148, f.o.b. Aetna, Pa., for standard ferromanganese, effective July 28. This represents a reduction of $2.50 per gross ton on carload shipments.

Pittsburgh Coke & Chemical Co. has established an f.o.b. furnace selling practice at Neville Island, Pa. Sometime ago this interest raised pig iron prices $3 a ton.

Buffalo — Across-the-board price increases of $4 a ton on pig iron were followed here by a further tightening in the tense supply situation.

Increases announced by the Hanna Furnace Corp. make the new local list prices, all f.o.b. Buffalo plant, the following: Basic and No. 2 foundry, $44; malleable, $44.50, and bessemer $45. In addition, silvery iron was increased $3 a ton to $57.75 for the 6.01 to 6.50 per cent silicon grade. This was the second boost in silvery in a month, the previous rise having been $4.

Operations hold at 94 per cent of capacity with only one of 16 stacks idle.

Cincinnati — Deliveries of pig iron are moderately better but still below the best levels of the year so far. Most foundries have completed vacation shutdowns and have resumed operations with production limited by bottlenecks in materials. Most southern iron now on shipment is taking the new price of $49.09.

Chicago — All pig iron interests here had advanced prices by last week. The increase was $4 across the board, except Carnegie-Illinois Steel Corp. which raised basic and foundry grades $4.50 a ton and malleable and bessemer $4.00. Oven prices are now as follows: Basic, $42.50 to $43.00; No. 2 foundry, $43.00 to $43.50; malleable, $43.50; bessemer, $44.

Of the district's 43 blast furnaces, 40 are now in operation.

Birmingham — The recent increase in pig iron prices has resulted in an even more insistent cry for iron. Most larger users have adjusted their schedules to regular allocations of iron, but miscellaneous smaller users are pretty hard pressed.

St. Louis — Missouri-Illinois Furnaces Inc. last week blew out its B furnace for a 75-day period for its first complete overhaul in seven years. This will cut this district's pig iron supply nearly 50 per cent.

Pledges Pig Iron to New England

Cleveland — Gray Iron Founders' Society reports that Colorado Fuel & Iron Co., Pueblo, Colo., has promised assistance in relieving the pig iron shortage among 200 New England foundries, resulting from the closing of Mystic Iron Works' blast furnace for relining.

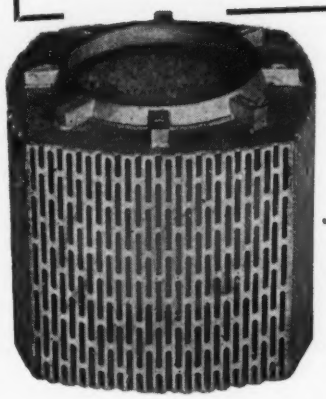
The relief pig iron will be shipped from Colorado's Buffalo plant, where a new stack will be put into blast about Aug. 16.

Ferroalloys . . .

Ferroalloy Prices, Page 135

Philadelphia — Bethlehem Steel Co. has announced a price on ferromanganese of $147, Johnstown, Pa. This compares with a $145 eastern seaboard price previously. Revisions by some other producers may follow

Perforated Strainers and—



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Scrap . . .

Scrap Prices, Page 138

Pittsburgh — Inability of steel producers to bolster scrap inventories in preparation for winter months, plus decision of metalworking companies not to sell scrap at former levels due to the sharp advance in finished steel prices, are considered major reasons behind increase of $2.50 per ton reported at leading consuming centers on sales of open-hearth grades. There is no certainty that the higher price level will bring out additional scrap for a number of fabricators are reported to be still holding out for higher prices.

In line with open hearth grades, carbon turnings prices also are reported to have been increased $2.50 per gross ton. Similarly the Pennsylvania Railroad is reported to have allotted some of its heavy melting steel at $44, delivered mill, representing increase of $2.50.

Philadelphia—No 1 heavy melting steel has advanced to a range of $45 to $46, delivered consumer plants. All other open-hearth grades are firmly established at the new levels announced last week, which reflect an increase of $2.50 a ton in the pricing formula. Even tonnages due on existing contracts are now moving at the new levels.

Cleveland — Mills in this district have increased steel scrap prices set forth in old contracts $2.50 a ton above the previous formula levels. Prices for cast iron grades are unchanged.

New York—Brokers' buying prices are now $39 f.o.b. shipping point, No. 2 heavy melting steel, No. 1 machine shop turnings, No. 1 busheling, Nos. 1 and 2 bundles, $37, No. 3 bundles, $35.

Machine shop turnings and mixed borings and turnings are now $31. to $31.50, short shovel turnings $33 to $33.50, punchings and plate scrap, cut structurals, electric furnace bundles, $42 to $42.50, No. 1 cupola cast $57 to $58. Others unchanged.

Boston — Open-hearth scrap is strong at the new level, $34.40 shipping point. An increasing volume was sold over the old formula before the revision. Other steel grades have moved up with the usual differentials applying. Dealers look for higher prices on cast grades, although the strength comes largely from outside.

Buffalo — Although no new sales of any consequence are reported, local scrap prices are now firmly established at $2.50 a ton above the old formula for steelmaking grades. Consumers are adjusting prices on outstanding orders to conform with the new price setup. To date, the advance is restricted to steelmaking grades, and does not include cast grades, turnings or specialties.

While the new prices on steelmaking grades are expected to be accepted readily by consumers, protests already have been heard over any comparable increase on other items at this time. Consumers pointed out that these items are now well above the old formula, and, therefore, are not entitled to a boost now. One of top users of low phos is refusing to go above $44.75. The consumer has returned to the old differential basis which places low phos at $2.50 above heavy melting.

Detroit — Increase in buying prices of openhearth scrap of $2.50 per ton is now an established fact, described by some brokers as simply the "legitimatizing" of off-the-record purchases which had been in effect for several months. The more pessimistic observers are inclined to the belief the "shadow" market will forthwith move to new high ground. Accelerating spiral of wages-prices convinces many a crack-up is an early possibility, possibly as soon as the first quarter of next year. Movement of cast scrap continues slow and prices nominal.

Cincinnati—The scrap market reacted to conditions in other districts, sending open hearth grades $2.50 higher than the old formula level.

Chicago — Scrap market here is assuming a semblance of order following the recent $2.50 advance in prices. Consumers voice objection to paying the new formula but are obliged to acquire material to maintain their steelmaking rates and lay down some inventory if possible. The higher price is clearing the log jam created when producers of scrap objected to selling ear-marked material at the old formula price while brokers were offering $2 a ton more.

Birmingham — Scrap has become somewhat more active in the past few days, according to local sources, although very little agricultural material is coming out in view of weather conditions which keep most farmers in the fields. Some railroad scrap was reported in evidence in the district last week and considerable heavy melting is said to have moved at measurably above price formula.

St. Louis — Heavy melting scrap last week went up $2.50 a ton, reflecting a similar increase at eastern points. It marked a dealer victory in the long battle of melters to hold to the $38.50 formula price. The price upsurge was accompanied by a sharp drop in shipments as sellers held back for still higher figures.

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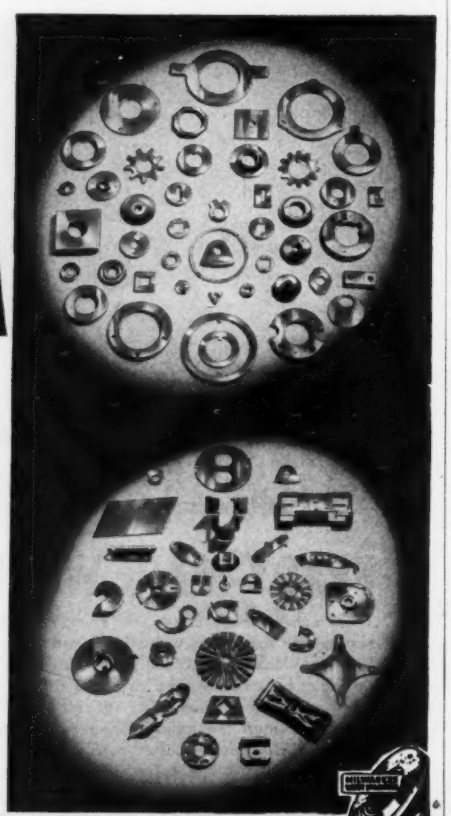

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Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 133

New York—With bolt and nut producers switching over to an f.o.b. mill basis and revising their price schedules in general, considerable confusion exists in this industry. It is estimated that semi-finished nuts at the markers, plants are being increased about 10 per cent on an average, cold punched and hot pressed nuts, 13 per cent and bolts about 16 per cent. An increase of $22 a ton has been named by one seller on structural rivets, the price amounting to 6.75c, mill.

Warehouse . . .

Warehouse Prices, Page 135

New York—Warehouse prices are substantially higher, reflecting changes in mill price and transportation charges, but they are still in a state of flux. Country prices here are now quoted tentatively as follows: 10 gage hot-rolled sheets, 5.73c; cold-rolled 17 gage sheets, 6.53c; 10 gage galvanized sheets, 7.63c; hot-rolled strip, 5.88c; hot-rolled bars (rounds)

5.63c; structural shapes, 5.32c; carbon plates, 5.78c; floor plates, 7.28c.

Philadelphia—Tentative warehouse steel prices here on a country basis are as follows: 10 gage hot-rolled sheets, 5.71c; 17 gage cold-rolled sheets, 5.66c; 10 gage galvanized sheets, 7.32c; hot-rolled strip, 5.45c; hot-rolled bars (rounds), 5.50c; cold-finished rounds, 6.16c; hot-rolled 4140 alloy bars, 7.94c; structural shapes, 5.20c; carbon plates, 5.50c; floor plates, 7.01c.

Boston — Steel warehouses are advancing prices in line with mill increases and going on an f.o.b. basis for delivery outside the Boston metropolitan district. The consumer outside this area pays the delivery costs. Depending on the sources of supply and the product involved, the new warehouse lists vary slightly.

Chicago — A leading warehouse in this district has announced the following Chicago country prices: 10 gage hot rolled sheets 5.05c, cold rolled 15 gage sheets 5.75c, 10 gage galvanized sheets 6.95c, hot rolled strip 4.85c, cold rolled strip 6.15c, hot rolled rounds 4.90c, cold finished rounds 5.70c, hot rolled alloy 4140 bars (as rolled) 7.65c, structural shapes 4.90c, carbon plates 5.10c and floor plates 6.55c.

Detroit — A highly confused situation confronts buyers of warehouse steel, inasmuch as jobbers now have to figure prices on the basis of quotations at their mill sources, plus the freight from these points. As yet such calculations have not been completed, but it would appear that every jobber will have a different set of prices, with those closest to mills having the lowest. To be competitive jobbers could set their prices on a par with other warehouses in the area, absorb freight on some products and make up the loss with higher quotations on others. However, there is no indication this will be done at the outset, so published warehouse price quotations will call for considerable interpretation. In the long run, warehouses see a major disruption of their established pattern of business occasioned by pricing steel at the "manufacturing point."

St. Louis — Price increases averaging 10 to 15 per cent have been announced by some warehouses in this district, with others delaying similar hikes pending clarification of the mill pricing situation.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2000 tons, building, International Rolling Mill Products Corp., Chicago, to American Bridge Co., Pittsburgh.

1700 tons, five-story building addition, Trico Products Corp., Buffalo, to the Bethlehem Steel Co., Lackawanna, N. Y.; John W. Cowper Co. Inc., Buffalo, general contractor.

1500 tons, Vine St. bridge, Philadelphia, through Golden Construction Co., to American Bridge Co., Pittsburgh; also 359 tons of bearing piles and sheet piling to Bethlehem Steel Co.

600 tons, warehouse, United States Rubber Co., Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

600 tons, apartment houses for Progressive Builders, Camden, N. J., for construction at Syracuse, N. Y., to American Bridge Co., Pittsburgh.

575 tons, warehouse, Rosenau Bros., Philadelphia, to Lehigh Structural Steel Co., Allentown, Pa.

480 tons, senior high school, Philadelphia, through John McShane, general contractor, to Bethlehem Steel Co.

475 tons, new school, Newfane, N. Y., to the Ernst Iron Works Inc., Buffalo; John W. Cowper Co. Inc., Buffalo, general contractor.

300 tons, municipal power plant, Menasha, Wis., to Milwaukee Bridge Co., Milwaukee.

290 tons, steam power plant, Grand Forks, N. D., to Des Moines Steel Co., Des Moines, Iowa.

100 tons, approximately, building 599, Navy yard, Philadelphia, to American Bridge Co., Pittsburgh.

STRUCTURAL STEEL PENDING

4000 tons, McNary dam and powerhouse; bids in to U. S. Engineer, Portland, Oreg., July 20.

3900 tons, superstructure, state bridge, Housatonic river, Shelton-Derby, Conn.; American Bridge Co., Pittsburgh, low.

2900 tons, addition, Richmond power house, Philadelphia Electric Co., Philadelphia, bids closed.

1800 tons, General Hospital, Buffalo.

500 tons, Sulphur Spring bridge, a state project, Arbutus, Md.; general contract reported placed with W. A. Wilkerstrom, New York.

500 tons, cable way for Hungry Horse dam, Montana; General-Shea general contractors.

450 tons, alterations, Burlington freight terminal, Chicago, for Chicago Union Station Co.; bids June 30.

430 tons, Maurice river bridge, Millville, N. J.; abandoned.

350 tons, addition, School No. 2, Queens, New York; bids asked.

345 tons, building, General Steel Warehouse Co. Inc., Skokie, Ill.; Engineering Systems Inc., Chicago, engineers; bids in.

311 tons, state bridge, Clearfield county, Pennsylvania; bids July 30.

275 tons, two recreational buildings, Philadelphia.

235 tons, state bridge, Delaware county, Pennsylvania; bids July 30.

150 tons, generator building construction, Connecticut Light & Power Co., Devon, Conn.; bids closed by United Engineers & Constructors Inc., Philadelphia, July 21.

130 tons, plant addition, Lansdale Tube Co., Lansdale, Pa.; pending.

100 tons or more, 220-foot span on H piling, Cowlitz river, Washington; bids to Lewis county commissioners, Chehalis, July 26.

Unstated, state bridges, Montana state, including 354-foot span in Missoula county, underpass in Phillips county, and nine concrete-steel spans in Prairie and Dawson counties; bids to Helena, July 22.

Unstated tonnage, addition, School No. 2, Queens, New York; bids asked.

Unstated tonnage, School No. 15, Queens, New York; bids asked.

Unstated tonnage, School No. 115, Queens, New York, pending; alternate bids on structural and concrete design are requested. This project was referred to in last week's issue as being School No. 15.

Unstated tonnage, School No. 14, Staten Island, New York, pending.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1500 tons, senior high school, Philadelphia, through John McShane, general contractor, to Bethlehem Steel Co.

350 tons, Statler Hall, Cornell University, Ithaca, N. Y., to the Bethlehem Steel Co., Lackawanna, N. Y.; John W. Cowper Co. Inc., Buffalo, general contractor.

170 tons, annex, Home for Aged Jews, Chicago, to Joseph T. Ryerson & Son Inc., Chicago; Morris Handler Co. Inc., Chicago, contractor.

100 tons, telephone exchange, Middle States Telephone Co., Des Plaines, Ill., to Joseph T. Ryerson & Son Inc., Chicago; W. H.

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REINFORCING BARS PENDING

2000 tons, factory building, Clark Equipment Co., Jackson, Mich.

1500 tons, Public Safety building, Seattle; Kuney & Johnson, Seattle, apparently low, $3,365,000; bids in excess of estimates.

1000 tons, junior high school building, Peoria, Ill.; George D. Johnson, Peoria, Ill., low on general contract.

900 tons, apartment house, Seattle; Nettleton, Baldwin, Anderson Co., general contractors.

900 tons, headworks, canal lining, etc. Columbia Basin project; bids to Bureau of Reclamation, Grand Coulee dam, Aug. 17.

480 tons, Jewish hospital, Minneapolis; bids deferred from June 30 to July 21.

370 tons, staff housing, University of Illinois, Urbana, Ill.; John Felmley Co., Bloomington, Ill., low on general contract; bids July 7.

350 tons, Statler Hall, Cornell University, Ithaca, N. Y.; John W. Cowper Co. Inc., Buffalo, general contractor.

310 tons, state bridge, Fayette county, Pennsylvania; bids July 30.

275 tons, school building, Sterling, Ill.

250 tons, Frost-Snyder building, Tacoma, Wash.; general contract placed.

184 tons, special education building, Illinois State Normal School, Normal, Ill.; John Felmley Co., Bloomington, Ill., low on general contract; bids July 13.

150 tons, new school, Newfane, N. Y.; John W. Cowper Co. Inc., Buffalo, general contractor.

100 tons, including radial gates, canal lining, etc., Caldwell project, Idaho; bids to Bureau of Reclamation, Boise, Aug. 5.

100 tons, Washington state highway projects; bids opened at Olympia, July 23.

Unstated, McNary dam and power house; bids opened by U. S. Engineer, Portland, Oreg., July 20.

Unstated, administration building, Illinois State Normal School, Normal, Ill.; bids July 13.

Unstated, underpass and state road projects; bids to Helena, Montana, July 22.

PIPE . . .

CAST IRON PIPE PENDING

150 tons, 6 to 24 inch and fittings; also filtration plant and equipment; bids to Pasco, Wash., Aug. 3; J. W. Graham and Associates, Portland, Oreg., engineers.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Nickel Plate, 10 steam freight locomotives, to Lima-Hamilton Corp., Lima, O.

RAILROAD CARS PLACED

Delaware, Lackawanna & Western, 500 hopper cars, to American Car & Foundry Co., New York. These are in addition to 500 box, 100 cement hopper, and 20 passenger cars recently noted as distributed.

St. Louis-San Francisco, 300 fifty-five-ton hopper cars, to Pullman-Standard Car Mfg. Co.'s Bessemer, Ala., plant. These are in addition to the 700 recently noted distributed.

RAILROAD CARS PENDING

Chesapeake & Ohio, 1000 coal cars; purchase authorized.

Chicago Transit Authority, 130 fifty-two passenger elevated and subway cars for Milwaukee Ave., Dearborn St. and Congress St. subway; St. Louis Car Co., St. Louis, low bidder at $5,310,400; Pullman-Standard Car Mfg. Co., Chicago, $6,077,500.

Mississippi Central, 300 box cars, bids asked.

Nickel Plate, 500 box cars; purchase authorized.

RAILS PENDING

Nickel Plate, 25,000 tons of rails for 1949 maintenance; purchase authorized.

CONSTRUCTION AND ENTERPRISE

ALABAMA

FLORENCE, ALA.—Alabama-Tennessee Natural Gas Co. is planning a $2,900,000 pipeline from Selmer, Tenn. to Huntsville, Ala.

ARKANSAS

EL DORADO, ARK.—Lion Oil Co., Col. T. H. Barton, chairman, has awarded a contract to Chemical Construction Corp., New York, for a $3,500,000 expansion program.

CALIFORNIA

CROCKETT, CALIF.—California & Hawaiian Sugar Refining Corp., Matson Bldg., San Francisco, has awarded a $100,000 contract to Haas & Rothschild, 274 Brannan St., San Francisco and Judson-Pacific Murphy Corp., 4300 Eastshore Highway, Emeryville, for a refinery enlargement.

SAN FRANCISCO—Frank W. Brady, 2130 Third St., will build an $80,000 bottling plant at Minnesota and 19th Sts.; H. L. Marchand, 593 Market St., engineer.

SOUTH SAN FRANCISCO, CALIF.—Superior Electrocast Foundry Co., 286 Twelfth St., has awarded a $200,000 contract to Soule Steel Co., 1750 Army St., San Francisco, for a steel frame factory.

IDAHO

KELLOGG, IDAHO—Sullivan Mining Co. is planning a $750,000 expansion program which will include several steel buildings at its electrolytic plant. Production will be stepped up from 3300 to 4000 tons monthly.

ILLINOIS

CENTRALIA, ILL.—The city has awarded a contract to Guy E. Tillman, 113 S. Hickory St., for a $270,000 water works filter plant; Warren and Van Praag Inc., 253 S. Park St., Decatur, engineers.

EAST ST. LOUIS, ILL.—Aluminum Ore Co., D. H. Tikson, works manager, 3300 Missouri Ave., has awarded a $750,000 contract to Fruin-Colnon Contracting Co., 1706 Oliver St., St. Louis 3, Mo., for erection of a plant to manufacture fluoride chemicals and ceramic cryolite.

MOLINE, ILL.—Herman Nelson Corp., R. H. Nelson, president, has awarded a $200,000 contract to Priester Construction Co., Davenport Bank Bldg., Davenport, Ia., for construction of a factory.

INDIANA

INDIANAPOLIS — American Foundry Co., Blaine Miller, president, 1535 Naomi St., plans to build four manufacturing plant buildings costing $1 million; Russ & Harrison, 1001 Architects & Builders Bldg., architects.

MARION, IND.—Anaconda Wire & Cable Co., has awarded a $100,000 contract to Bowman Construction Co. for erection of a factory warehouse addition.

IOWA

EAGLE GROVE, IOWA—The city has awarded a $61,900 contract to the Pittsburgh-Des Moines Steel Co., 1015 Tuttle St., Des Moines, to furnish and erect a 400,000-gal steel water tank; Howard R. Green Co., Bever Bldg., Cedar Rapids, engineers.

KANSAS

TROY, KANS.—Doniphan Electric Cooperative Inc., N. V. Wakeman, manager, has awarded a $62,330 contract to the D-K-L Construction Co., Jackson, Miss., for the construction of 165.48 miles of rural electric lines in Doniphan county using the cooperative's pole and line materials.

OHIO

ASHTABULA, O.—Carlson Sheet Metal Co., 1108 W. Fifth St., has moved to its new plant at 404 E. Fifth St. More room for

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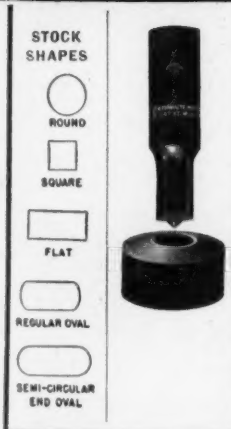

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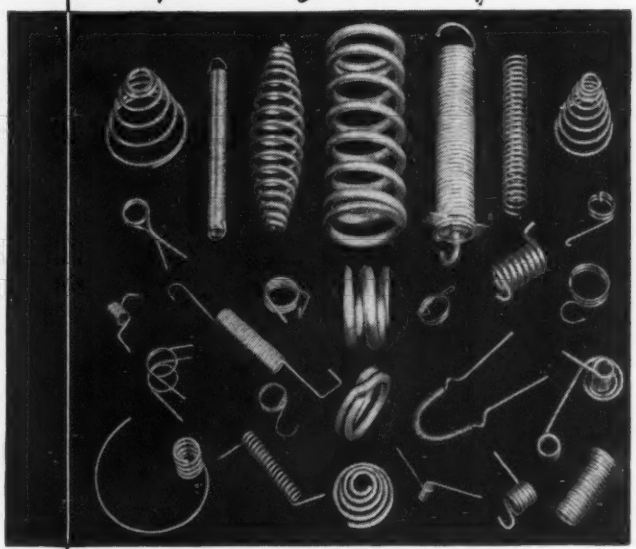

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heavy equipment is provided. Plans are also being made for a new building east of the plant.

CLEVELAND—Parker Appliance Co., Pacific Division, H. E. Schroeder, manager, 17325 Euclid Ave., has doubled its manufacturing space with the acquisition of the $300,000 Los Angeles plant of Air Associates Inc. of Teterboro, N. J.

CLEVELAND—Capco Corporation, c/o Gerald A. Doyle, attorney, 517 NBC Bldg., is being organized to take over the manufacturing of gas hot plates and small freezers now made by the Eastern Mfg. Co., 12900 Berea Rd.

CLEVELAND—Shepherd Special Machine & Die Co. has been formed by Marvin O. Shepherd to manufacture special machinery, tools, dies, jigs and fixtures for the metalworking industry. The new firm has acquired the plant of Laeco Inc., 15215 Chamfield Ave.

CLEVELAND—Jones & Laughlin Steel Corp. has awarded a $1 million contract to National Engineering & Contracting Co., W. Fourth St. and Central Ave., for construction of foundations for a new blooming mill for the steel plant at Jennings Rd.

OREGON

WILBRIDGE, OREG.—Morris P. Kirk & Sons, 2714 S. Indiana St., Los Angeles, plan to build a $500,000 lead smelter and warehouse.

PENNSYLVANIA

MARCUS HOOK, PA.—General Chemical Co., 1100 Line St., Camden, N. J. has awarded a $100,000 contract to Wigton-Abbott Corp., 1225 South Ave., New York, for construction of an industrial building; Edwards & Green, Broadway and Charman St., Camden, N. J., engineer and architect.

TENNESSEE

GALLATIN, TENN.—The city plans a $700,000 natural gas distribution system.

LEWISBURG, TENN.—The city is planning a natural gas distribution system costing $500,000; J. W. Goodwin Engineering Co., 726 S. 29th St., Birmingham, Ala., engineers.

NASHVILLE, TENN.—Mantle Lamp Co., Victor S. Johnson Jr., 223 W. Jackson, Chicago, is building a $4 million plant on Murfreesboro Rd. to manufacture stoves, lanterns, thermos bottles and lamps.

TEXAS

CORPUS CHRISTI, TEXAS—Central Power & Light Co., 120 N. Chapparal St., has awarded a $460,000 contract to A. E. Hinman, Wilson Bldg., for erection of a 6-story superstructure for an electric power plant, a concrete duct, a screen house, piping, and water supply structures.

DALLAS, TEX.—Lone Star Gas Co. plans additional natural gas facilities in Oklahoma and Texas costing $1,059,500.

HOUSTON, TEX.—Sun Oil Co., M. Esperson Bldg., has awarded a $1,250,000 contract to J. F. Prichard Co., Fidelity Bldg., Kansas City, Mo., for construction of a gas plant to extract liquid hydrocarbons from flare gas.

TEXAS CITY, TEX.—Pan American Refinery Corp., Harold R. Snow, manager, will receive bids for a two-story office building, pilot plant, and laboratory addition, chemical laboratory building, gate house and change house, and alterations to present building.

WASHINGTON

SEATTLE—American Marietta Co. has awarded a contract to M. P. Buttler for expansion including a steel frame boiler house and alterations to the local adhesive, resin, and chemical plant at 3400 Thirteenth St., S. W. Bids will be called soon for a piping project.

SPOKANE, WASH.—Pacific Telephone & Telegraph Co. is planning construction of a steel frame engineering building at Columbia and Cataldo.

TACOMA, WASH.—American Mfg. Co., c/o Eugene Cunningham, Seattle, is reported to have leased a 10-acre tract from Port of Tacoma on which to build a steel ingot plant to supply an Eastern automobile manufacturer.

WISCONSIN

MILWAUKEE — Allen-Bradley Co., 136 W. Greenfield Ave., has awarded a $1 million contract to Selzer-Ornst Co., 6222 W. State St., Wauwatosa, for a factory addition.

CANADA

TORONTO, ONT.—Building Products Ltd., 2 College St., has awarded a $95,000 contract to Anglin-Norcross Ontario Ltd., 57 Bloor St. W. for an office addition and two warehouses; Allward & Goumlock, 57 Bloor St. W., architect.

HULL, QUE.—Canada Cement Ltd., Canada Cement Bldg., Montreal, has awarded a $500,000 contract to Doran Construction Co. Ltd., 5 Concord St., for erection of a rock crushing plant.

MONTREAL, QUE.—Lance Co., 2019 Moreau St., has awarded a $125,000 contract to Ain & Zukuta, 4929 Isabella Ave., for construction of a factory; M. W. Roth, 204 Notre Dame St., architect.

PRICES OF LEADING FERROALLOYS PRODUCTS

(*Concluded from Page* 135)

e.l. and 0.9c for l.e.l.; Western, add 0.35c for e.l. and 1.5c for l.e.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8.7c per lb of briquet, c.l. packaged 9.5c, ton lot 10.3c, less ton 11.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Eastern Zone, contract, c.l. bulk 8.75c per lb of briquet, c.l. packed 9.55c, ton lot 10.35c, less ton 11.25c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 5.1c per lb of briquet, c.l. packed 5.25c, ton lot 6.7c, less ton 7.6c. **(Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 5.25c c.l. packed 6.05c, ton lots 6.85c, less ton 7.75c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 17.50c per lb of alloy, carload packed 19.0c, ton lot 19.8c, less ton 20.8c; Central, add 0.5c for c.l. and 0.85c for l.c.l.: Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 16.25c per lb of alloy, carload packed 16.45c, ton lot 19.35c, less ton 20.85c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

Vanadium Oxide: All Zones, contract, less carload lots, $1.20 per lb of contained V_2O_5. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

Ferrotitanium, High-Carbon: (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 200 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.75c, ton lot 7.5c, less ton 8.35c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.40c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone contract, 100 lb or more. 1" x D, $1.20 per lb of alloy, freight allowed. Less than 100 lb $1.30; Central, add 0.75c; Western add 2.9c, freight allowed. Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, carload packed 17.25c per lb of material, ton lot 18.00c, less ton 19.25c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l., and 3.05c for l.c.l. Freight allowed.

Silcaz Alloy: (Si 35-40%, Ca 9-11%; Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 39c per lb of alloy, ton lot 41c, less ton 43c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 15.0c per lb of alloy, ton lot 15.75c, less ton 17.0c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

Graphidox No. 4: (Si 56%, Ca 5%, Ti 9%) C.l. packed, 16.50c per lb. of alloy; ton lots 17.90c; less ton lots 19.40c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%; V-7, Cr 28-32%, Si 15-21%, Mn 14-16%) C.l. packed, 12.95c per lb. of alloy; ton lots 14.60c; less ton lots 15.85c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base): Gross tons per carload, fob sellers' works, Mt. Pleasant, or Siglo, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.